VOLUME XIX JULY 1926 NUMBER 7

Southern Medical Journal

Journal of The Southern Medical Association

Published monthly by the Southern Medical Association, Empire Building, Birmingham, Ala. Annual subscription $4.00. Entered as Second-Class Matter at the Post Office at Birmingham, Ala., under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of Oct. 3, 1917, authorized Dec. 20, 1921.

SOUTHERN MEDICAL ASSOCIATION—Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

TABLE OF CONTENTS

MEDICINE—Internal Diseases, Pediatrics, Neurology, Diagnostic Methods, Etc.

Further Studies on Pyelitis. Henry F. Helmholz, Rochester, Minn. 501

The Diagnosis of Carcinoma of the Esophagus and a Short Discussion of its Treatment. E. B. Freeman and H. E. Wright, Baltimore, Md. 508

Discussed by J. Russell Verbrycke, Jr., Washington, D. C.

Modern Aspects of Syphilis. C. Brooks Willmott, Louisville, Ky. 513

Discussed by Emmett R. Hall, Memphis, Tenn.; Rex Bolend, Oklahoma City, Okla.; Sidney J. Wilson, Fort Worth, Tex.; F. J. Eichenlaub, Washington, D. C.

Four Cases of Olivo-Ponto-Cerebellar Atrophy Giving a History of Heredity with Three Autopsies. Wm. Keiller, Galveston, Tex. 518

Recent Phases of the Rickets Problem. L. von Meysenbug, New Orleans, La. 522

Discussed by James H. Park, Jr., Houston, Tex.

Further Observation on Non-Surgical Drainage of the Bile Channels. Ernest B. Milam, Jacksonville, Fla. 526

Discussed by J. Russell Verbrycke, Jr., Washington, D. C.; Daniel N. Silverman, New Orleans, La.; Evarts V. De-Pew, San Antonio, Tex.; Tate Miller, Dallas, Tex.

TROPICAL DISEASES AND PUBLIC HEALTH

The Child Health Demonstration. Bernard W. Carey, Athens, Ga. 532

Discussed by H. S. Mustard, Murfreesboro, Tenn.

Morbidity Reports in County Health Work. Roy K. Flannagan, Richmond, Va. 535

Discussed by B. M. Primer, Austin, Tex.; K. F. Maxcy, Montgomery, Ala.; D. J. Williams, Gulfport, Miss.; J. J. Durrett, Memphis, Tenn.

(Concluded on next page)

PALFREY'S ART OF MEDICAL TREATMENT

By FRANCIS W. PALFREY, M.D., Instructor in Medicine,
Octavo of 475 pages. Cloth, $4.50 net.

Dr. Palfrey's book is a different kind of medical book. It is a work on the physician's relation to his patient and his patient's relatives and friends. It is the art of conducting a case. Realizing that a physician is called primarily because a patient is uncomfortable, Dr. Palfrey believes that one of the first duties of the physician is to do something for the comfort of the patient. To this end he gives a list of medical diseases and of all symptoms that are commonly treated symptomatically, together with the therapeutic measures that will in most cases constitute satisfactory treatment. The mental side of the case is given special attention, including the mental guidance not only of the patient but of the patient's relatives and friends. The arrangement of the book follows the order in which the physician thinks as he conducts a case.

Send Orders to

New Orleans J. A. MAJORS COMPANY Dallas

TABLE OF CONTENTS—Concluded

SURGERY—Railway, Industrial, Gynecological, Obstetrical and Urological

A Brief Summary of Benign and Malignant Lesions of Bone. Joseph Colt Bloodgood, Baltimore, Md. 541

Discussed by M. S. Henderson, Rochester, Minn.; F. Walter Carruthers, Little Rock, Ark.

Apophysitis of the Os Calcis. John T. O'Ferrall, New Orleans, La. 549

Papillary Epithelioma of the Kidney Pelvis: Case Report. Perry Bromberg, Nashville, Tenn. 550

Low or Cervical Cesarean Section. Minford Armour Hanna, Kansas City, Mo. 554

Discussed by Willard R. Cooke, Galveston, Tex.

Major Post-Operative Conditions Following Acute Suppurative Appendicitis. Frank L. Barnes, Houston, Texas 558

Deficient Fixation of the Right Colon. Frank C. Beall, Fort Worth, Texas 560

Discussed by K. H. Aynesworth, Waco, Tex.; A. B. Small, Dallas, Tex.

EYE, EAR, NOSE AND THROAT

Cavernous Sinus Thrombosis: Report of a Case. D. C. Montgomery, Greenville, Miss. 566

Septicemia of Otitic Origin. Frederick E. Hasty, Nashville, Tenn. 570

Papers of Dr. Montgomery and Dr. Hasty discussed by John N. Foster, Houston, Tex.; Clifton M. Miller, Richmond, Va.; Homer Dupuy, New Orleans, La.; William D. Gill, Fort Sam Houston, Tex.

EDITORIALS 576

Effect of Thyroid Extract upon Formation of Bile

White and Negro Sweat Glands

Blood Changes after Severe Superficial Burns

ATLANTA—WHERE WE MEET 578

Begin Thinking of Atlanta. Fred Houser, Atlanta, Ga.

CORRESPONDENCE 579

Is Cataract Hereditary? T. M. McIntosh, Thomasville, Ga.

BOOK REVIEWS 580

SOUTHERN MEDICAL NEWS 581

LOWSLEY & KIRWIN'S Text-Book of Urology

A complete text-book in one volume. It is based upon eighteen years of intensive study devoted to laboratory research and clinical experience in the hospital and private practice of surgery of the genital and urinary organs. The authors have had unusual opportunities for observing the methods of the masters in their own and in many foreign countries. These advantages have been supplemented by their constant review of the vast literature of recent years. This great mass of widely derived information has been successfully reduced to the dimensions of a practical text for students and practitioners.

The historical background is covered in the introductory chapter; and this is followed by one upon the general Diagnostic Procedures of Urology. Beginning with Chapter III, the parts and organs are considered in their anatomical sequence from without inward. The embryology, morphology and anomalies of each are followed by a succinct but clear presentation of the injuries and diseases, with the most approved methods of diagnosis and treatment. Only such operations as have passed the test of personal experience have been given in detail. These are described accurately and illustrated with drawings and photographs. With a moderate number of exceptions, the illustrations are all original. The illustrative feature, in correlation with the text, adds much to the lucidity and value of the work.

Through the courtesy of his publishers, illustrations and material from the late Dr. E. Desnos' unequaled monograph upon the history of urology are now for the first time made available to those unfamiliar with the French language. Professor E. Christeller of Virchow's Krankenhaus, Berlin, has kindly allowed the use of several colored plates which demonstrate his new technic of freezing entire organs for microscopic section. By this method he is able to eliminate the weeks of time-consuming effort heretofore required in the preparation of specimens for examination. It has been found that regional anesthesia is useful for operations upon every organ of the genital and urinary tracts. Attention is called to the methods employed by the authors, who are among the pioneers in this field in America.

By OSWALD SWINNEY LOWSLEY, M.D., F.A.C.S., Director of the Department of Urology (James Buchanan Brady Foundation) of the New York Hospital; consulting Urologist to the Hospital for the Ruptured and Crippled, the New York Skin and Cancer Hospital, Peekskill Hospital, etc., Fellow of the American Urological Association; and THOMAS JOSEPH KIRWIN, PH.C., M.D., Chief of Clinic of the Department of Urology (James Buchanan Brady Foundation) of the New York Hospital; Adjunct Visiting Urologist, New York Hospital; Assistant in Urology, Cornell University Medical College; Assistant in Anatomy, Columbia University Medical College; Fellow of the American Urological Association. Octavo, 698 pages with 233 engravings and 13 plates. *Cloth*, $10.00 *net*.

S. Washington Square **LEA & FEBIGER** Philadelphia

X

Brewers' Yeast A Specific for Disease

In the preparation of highly concentrated products of Vitamine-B, from fresh brewers' yeast, we believe we are working with the purest specimens of medicinal brewers' yeast available.

For years, we have supplied medicinal brewers' yeast and concentrate to universities, colleges, experiment stations and the U. S. Public Health Service, for studies in nutrition and for clinical practice.

Brewers' Yeast-Harris is a dry granular powder. It can be shipped or stored in all climates, at all seasons of the year. It *keeps indefinitely,* in a dry place, at room temperature.

The U. S. Public Health Service has recently announced the improvement and *cures of 26 cases of pellagra* in the Georgia State Sanitarium, with the addition of *Brewers' Yeast-Harris* to the diet.

Geo. R. Cowgill, Yale Univ., has shown the *improvement of appetite in caged dogs,* when fed small, daily amounts of Yeast Vitamine-Harris Concentrate—rich in Vitamine-B.

Barnett Sure, Univ. Ark., reported *increase milk secretion in nursing mothers,* when fed liberal amounts of Yeast Vitamine-Harris Tablets.

H. J. Gerstenberger, Lakeside Hospital, Cleveland, Ohio, reported a series of cases of *Herpetic Stomatitis* and *Herpes Labialis,* cured with addition of Yeast Vitamine-Harris Tablets to the regular diet.

Goldberger and Tanner, U. S. P. H. Service, reported *cures of black tongue in dogs,* when fed Brewers' Yeast-Harris (medicinal).

The Connecticut Experiment Station and U. S. P. H. Service have shown the *superiority of brewers' yeast over bakers' yeast,* as a source of Vitamine-B and as a cure for *specific disease.*

Sample bottle of yeast or Yeast Vitamine Tablets . . . . . $1.50 each

THE HARRIS LABORATORIES

Tuckahoe, New York

If you could take the College with You!

The MEDICAL INTERPRETER makes a continuous "Post-Graduate" course possible!

The MEDICAL INTERPRETER begins where the college leaves off. It takes up and carries on into your actual practice the new attitudes—the "applied articles" that no college could well supply you with, because the scope and purpose of the Medical Interpreter is to bring to the finer points of analysis the fundamentals taught in college. To the young graduate (and thousands of them have taken the field within the past 60 days), the Medical Interpreter is a "ladder of learning" on which to climb to the coveted heights of the medical profession! It is a CONSTANT HELP. It is a guide. It is an encouragement. It is an inspiration. It contains ONLY SOUND DOCTRINES! It does not deal in experimentalism. It does not exploit, capitalize or cater to the expressions of opinions. IT DEALS ONLY IN FACTS! In other words, the messages printed in the MEDICAL INTERPRETER SERVICE are stripped down to the truth, relieved of any confusing phraseology; and reduced to the fewest possible words to make sense and give the thought clearly to the student or the practitioner. Words in the MEDICAL INTERPRETER are worth their weight in gold! Words that convert thoughts expressed into WORKABLE, PRACTICAL instances that you can apply at the sick bed; rely on in emergencies, and adopt as reliable rules of procedure.

To the young graduate there is no one other thing so fraught with SERVICE as the MEDICAL INTERPRETER. SERVICE that actually DOES THINGS for him. We will be more than happy to be able to give you all the intimate information about the MEDICAL INTERPRETER if you will give us the opportunity by signing and mailing coupon attached, or otherwise advising us. NO OBLIGATIONS INVOLVED.

"If it's NEW—and of VALUE—it's in the MEDICAL INTERPRETER"

—A SERVICE—

THE MEDICAL INTERPRETER

1716 Pennsylvania Avenue, N.W.
Washington, D. C.

THE MEDICAL INTERPRETER, WASHINGTON, D. C.
☐ Send your Representative ☐ Mail Information
Check either square for immediate attention
Name.....
Street.....
City..... State.....

LIPPINCOTT BOOKS

KARSNER—Text-Book of Pathology

By Howard T. Karsner, M.D., Professor of Pathology, Western Reserve University. Octavo. Illustrated. Cloth. Tentative price, $10.00.

A thoroughly modern and entirely new book representing the views of the most up-to-date teachers and investigators, excellently written and arranged. It is confined to human pathology and interweaves the anatomic, functional and clinical phases with the pathological material in such a manner as to provide unity of thought and interpretation.

FOOTE—Diseases of the New-Born

By John Foote, M.D., Assistant Professor of Therapeutics and Materia Medica, Georgetown University School of Medicine. Octavo. 230 Pages. 85 Illustrations. Cloth, $5.00.

This volume is concerned alone with the diagnosis and treatment of the disabilities most commonly seen in the new-born, with facts relative to the alarmingly high death rate during the first weeks of life. Covers injuries and accidents in the new-born, intracranial hemorrhage, digestive disturbances, infections, etc., methods and procedures in diagnosing and treating conditions and all the problems of prenatal, natal and neonatal mortality.

CRAIG—Parasitic Protozoa of Man

By Charles F. Craig, M.D., M.A., Late Director of Laboratories and Professor of Bacteriology and Preventive Medicine, Army Medical School. 569 Pages. 95 Illustrations. Cloth, $7.00.

The first work in English that adequately covers this field from the viewpoint of the medical practitioner. Contains every known fact of real importance regarding the various protozoan parasites responsible for the malarial fevers, amoebic dysentery, sleeping sickness, kala-azar, tropical ulcer, Chagas disease and other serious infections of man.

HENDERSON—Experimental Pharmacology

By Meyer and Gottlieb, Translated by Professor Velyien E. Henderson, Department of Pharmacology, University of Toronto. 626 Pages. 87 Illustrations. Cloth, $7.00.

This text-book presents the subject of Pharmacology from a viewpoint that explains logically the actions of remedies in health and disease. The subject is approached from the physiology of each organ and its pathological conditions, showing how its functions may be altered by certain remedial agents. It proceeds from the stand of a physician who inquires into the site and cause of diseased conditions and is a thorough preparation for therapeutics. A direct translation from the Seventh Edition of Meyer and Gottlieb's famous medical classic.

CUSHING-BAILEY—A Classification of the Tumors of the Glioma Group on a Histogenetic Basis with a Correlated Study of Prognosis

By Harvey Cushing, M.D., and Percival Bailey, M.D., Surgical Clinic and Laboratory, Peter Bent Brigham Hospital, and Laboratory of Surgical Research, Harvard Medical School. 175 Pages. 107 Illustrations. Cloth, $5.00.

From records of over 400 "verified gliomas" the authors have cleared up a very complicated subject and supplied material increasingly valuable to the neurosurgeon who would see all around his problem. The material has been arranged in a way that is logical, understandable and useful to all who are working in this comparatively new field.

J. B. LIPPINCOTT COMPANY, PHILADELPHIA, PA.

LIPPINCOTT BOOKS

International Medical Annual—1926

This is the 44th year of this unique and invaluable annual review of the world's progress in medicine and surgery. Thirty-four eminent specialists have done for you a vastly important service which you could not possibly do for yourself. Each in his own field, with the help of the editorial staff, has kept track of every new development throughout the world, recorded those of proved value, and now tells the story. The result is a wonderfully adequate survey which brings your library right up to date. Truly a godsend to the busy general practitioner, and the one thing needful to keep the specialist in touch with the general field. The book is handsomely bound, has 567 pages, 67 plates, many of them in colors, and 56 other illustrations. A very profitable investment for you at $6.00 net, postage paid.

THE CONTRIBUTORS AND SUBJECTS COVERED INCLUDE:—

Abdominal Surgery—E. Wyllys Andrews and Edmund Andrews, Chicago. *Anesthetics*—Joseph Blomfield, London. *Arterial Thrombosis*—A. Rendle Short, Bristol. *Children's Diseases*—Reginald Miller, London. *Diabetes*—Hugh MacLean, London. *Ear, Nose and Throat*—A. J. M. Wright, Bristol. *Eye Diseases*—A. E. Lister, Bristol. *Food Poisoning*—W. G. Savage, Somerset. *Gastro-Intestinal Disorders*—Robert Hutchison, London. *Genito-Urinary Surgery*—Sir John Thomson-Walker, London. *Gynecology and Obstetrics*—Wm. E. Fothergill, Manchester. *Heart and Blood Vessels*—S. B. Boyd Campbell, Belfast, and J. E. McIlwine, Belfast. *Infectious Diseases, Acute*—John D. Rolleston, London. *Liver Diseases and Liver Function Tests*—J. H. Anderson and Edmund I. Spriggs, Ruthin Castle, North Wales. *Medicine, General*—Ivor J. Davies, Cardiff. *Mental Diseases*—Henry Devine, Portsmouth. *Nervous System, Diseases of*—Sir James Purves-Stewart, Westminster. *Nervous System, Surgery of*—A. W. Adson, Mayo Clinic. *Orthopedic Surgery*—Ernest W. Hey Groves, Bristol. *Osteogenesis Imperfecta*—Geoffrey Hadfield, Bristol. *Psychological Medicine*—Henry Devine, Portsmouth. *Public Health*—Joseph Priestly, London. *Radio-Activity and Electrotherapeutics*—Chas. Thurstan Holland, Liverpool. *Rejuvenation*—Kenneth M. Walker, London. *Respiratory Tract, Diseases of*—W. H. Wynn, Birmingham. *Skin Diseases*—E. G. Graham Little, London. *Surgery, General*—Sir W. Ireland de Courcy Wheeler, Dublin. *Surgery, Rectal*—J. P. Lockhart-Mummery, London. *Thyroid Diseases*—T. P. Dunhill, London, and Francis R. Fraser, London. *Tropical Diseases*—Sir Leonard Rogers, London. *Venereal Diseases*—L. W. Harrison, London.

Write for New 1926 Illustrated Descriptive Catalogue

WILLIAM WOOD & CO. (Publishers Since 1804) 51 Fifth Avenue, New York

You Will Want This New Book

A MANUAL OF CLINICAL LABORATORY PROCEDURE

FOR THE USE OF THE GENERAL PRACTITIONER

By ROBERT A. KILDUFFE, A.B., A.M., M.D.

Director of Laboratories, The Atlantic City Hospital; City Bacteriologist, Atlantic City, N. J.; Consulting Serologist, Betty Bacharach Home for Crippled Children, Atlantic City, N. J.; Formerly Director of Laboratories, the Pittsburgh Hospital, Pittsburgh; Director of Laboratories, the McKeesport Hospital, McKeesport, Pa.; City Bacteriologist, McKeesport, Pa.; Consulting Serologist, Providence Hospital, Beaver Falls, Pa.; Major M.C., U.S.A.

300 pages, with 55 illustrations. Price, silk cloth binding, gold stamping, $3.00

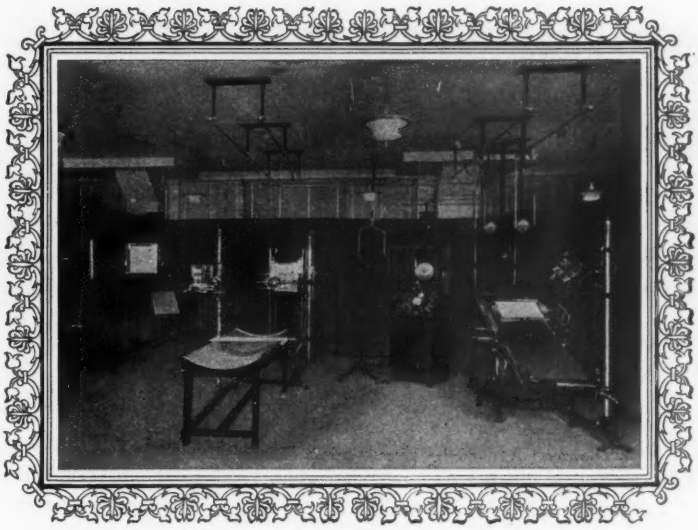
THE author has had much experience with laboratory work during recent years. He is therefore able to present reliable and at the same time relatively simple methods for the performance of such clinical laboratory procedures as are feasible in the office of the practitioner at large; to suggest, briefly, their clinical significance; to outline ways and means for the proper utilization of the resources of the clinical laboratory; and to present this matter in a simple, brief form.

THE C. V. MOSBY CO., 3616 Washington Blvd., St. Louis, Mo. (S.M.J.)

Gentlemen: Send me, on 5 days' approval, a copy of the new book by KILDUFFE on CLINICAL LABORATORY PROCEDURE. Price, cloth, $3.00.

Name.....

Address.....



Whatever the Cost May Be

Human health and life outweigh commercial expediency. For which reason the Victor X-ray Corporation considers only diagnostic and therapeutic needs in conducting research for the advancement of roentgenological technique.

Hence no technical or financial obstacle is permitted to stand in the way of developing and manufacturing Victor X-ray apparatus, however heavy the investment in new research and manufacturing equipment may be.

It is to this policy that Victor X-ray apparatus owes its supremacy. It has made possible the outstanding engineering developments which have contributed so much to the extraordinary evolution of American roentgenology.

Whether a Victor machine is intended for general practice or the large institution, it is developed in the same intensive spirit and manufactured with the same care. May we help you in the selection of equipment best suited to your individual requirements?

Visiting Chicago This Summer?

Physicians visiting Chicago this summer can well afford to spend a few interesting hours at the Victor plant, to look over our extensive facilities for research, engineering development, education and manufacture. Above is one of the booths on our Exhibit floor, showing an actual installation of X-ray equipment with which working demonstrations can be made.

This and other similar booths, exhibiting the complete line of Victor X-ray and Physical Therapy apparatus, offer many practical suggestions in the selection of equipment for any range of service in the physician's office or hospital. Our location in the medical center of Chicago makes the Victor plant an ideal headquarters for visiting physicians. A cordial invitation is extended you to come in and look over the latest developments in electro-medical equipment.

VICTOR X-RAY CORPORATION, 2012 Jackson Blvd., Chicago

33 Direct Branches—Not Agencies—Throughout U. S. and Canada

X-RAY
Diagnostic and Deep Therapy Apparatus. Also manufacturers of the Coolidge Tube

VICTOR

PHYSICAL THERAPY
High Frequency, Ultra-Violet, Sinusoidal, Galvanic and Phototherapy Apparatus

ANNOUNCING—

Isacen "Roche"

A New and Scientific Laxative

WE take both pride and pleasure in announcing to the profession a new chemical substance, evolved in the Roche Scientific Laboratories, which exerts a very fine laxative action in minute dosage, yet is non-toxic—in fact perfectly harmless.

This new substance is diacetyl-dioxyphenyl-isatin, a synthetic derivative of Indigo. It is a white crystalline powder, odorless and tasteless. It passes through the stomach unchanged and does not become active until it reaches the proper site for action, the intestine.

No renal or hepatic irritation need be feared from the use of Isacen, for this new purgative substance is not absorbed. It is entirely eliminated by the intestine—not even a trace of it can be found in the urine. Hence, Isacen can be taken with safety over periods of time even in those cases where there is a liver or kidney derangement.

Isacen is marketed in the form of small tablets each containing $^1/_{13}$ grain of the substance. As is the Roche custom, Isacen was thoroughly investigated both pharmacologically and clinically before its formal announcement to the profession.

Literature and complimentary supply for trial on request

The Hoffmann-La Roche Chemical Works, New York
Makers of Medicines of Rare Quality

Two names always associated in the minds of diabetic specialists

INSULIN
LILLY

The first commercial preparation of Insulin available to the medical profession of the United States

1876 Lilly 1926 FIFTY YEARS OF PROGRESS

Para-Thor-Mone

LILLY

(THE HORMONE OF THE PARATHYROID GLAND)

Prepared Under Authority Of the University of Alberta

Para-thor-mone is the name applied by Eli Lilly and Company to the purified, stabilized, standardized, active hormone of fresh parathyroid glands.

The methods used in the preparation of Para-thor-Mone, Lilly, and for its standardization, are those developed at the University of Alberta, Canada, by Prof. J. B. Collip, Department of Biochemistry.

USES OF PARA-THOR-MONE

In cases of post-operative tetany, Para-thor-mone is a specific. It relieves so-called idiopathic tetany and infantile tetany, and should be useful in medical practice in those cases in which the blood calcium is subnormal, or in certain circumstances of normal blood calcium in which the production of a mild hypercalcemia might be beneficial. Satisfactory clinical reports indicate it may be useful in chorea, acute and chronic urticaria, refractory ulcers and laryngeal tuberculosis.

HOW PARA-THOR-MONE IS SUPPLIED

Para-thor-mone is supplied through the drug trade in 5 cc). vials containing 100 units (20 units per cc.)

Write for detailed information

ELI LILLY AND COMPANY
INDIANAPOLIS, U. S. A.

GILLILAND
SCARLET FEVER PRODUCTS

TREATMENT

SCARLET FEVER STREPTOCOCCUS ANTITOXIN
(Concentrated and Refined)

PROPHYLACTIC SYRINGE PACKAGE
Contains sufficient antitoxin to neutralize at least 100,000 skin test doses.

THERAPEUTIC SYRINGE PACKAGE
Contains sufficient antitoxin to neutralize at least 300,000 skin test doses.

DIAGNOSIS

BLANCHING TEST
Vial package sufficient for 10 tests.

DETERMINING SUSCEPTIBILITY

SCARLET FEVER STREPTOCOCCUS TOXIN
(For Dick Test)
Package containing sufficient toxin for 10 tests
Package containing sufficient toxin for 50 tests
Package containing sufficient toxin for 100 tests
Package containing sufficient control for 50 tests

ACTIVE IMMUNIZATION

SCARLET FEVER STREPTOCOCCUS TOXIN
(For Immunizing)
Package of 3-1cc Vials (One Immunization)
Package of 30-1cc Vials (Ten Immunizations)

(This dosage for Immunizing is based on recommendations of Doctors Young and Orr, following extensive research and actual immunization of large groups in the institutions of the State of Michigan.—Journal American Medical Association, Page 1340, Vol. 86, No. 18, May 1, 1926. You will note that only 3 doses are required to produce active immunization.)

LITERATURE AND PRICES ON REQUEST

THE GILLILAND LABORATORIES, INC.
Producers of Biological Products
MARIETTA, PA.

U. S. Government License No. 63

ANNOUNCING...

IPRAL

a new hypnotic marketed by

SQUIBB

The Calcium Salt of Ethylisopropylbarbituric Acid

RECOMMENDED BECAUSE:

It produces a refreshing sleep without the usual feeling of lassitude and torpor the next day.

It is quite soluble in water, hence quickly absorbed, and rapid in action.

Its average effective dose is small (2 to 4 grains).

Its toxicity is low.

The margin of safety between the therapeutic and the lethal dose is wide.

It is of particular value in combating the restlessness, irritability, and sleeplessness often met with after major operations and in nervous disorders.

Ipral is marketed as 2-grain tablets, in bottles of 100 tablets.

Write for Literature

E·R·SQUIBB & SONS, NEW YORK, U.S.A.

MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

McGuire Clinic

ST. LUKE'S HOSPITAL
Richmond, Virginia.

Medical and Surgical Staff

General Medicine
Garnett Nelson, M.D.
James H. Smith, M.D.
Hunter H. McGuire, M.D.
Margaret Nolting, M.D.
John Powell Williams, M.D.
Joseph T. Graham, M.D.

Pathology and Radiology
S. W. Budd, M.D.

Roentgenology
A. L. Gray, M.D.
J. L. Tabb, M.D.

General Surgery
Stuart McGuire, M.D.
W. Lowndes Peple, M.D.
Carrington Williams, M.D.
Beverly F. Eckles, M.D.

Orthopedic Surgery
William T. Graham, M.D.
D. M. Faulkner, M.D.

Dental Surgery
John Bell Williams, D.D.S.
Guy R. Harrison, D.D.S.

Eye, Ear, Nose and Throat
Thomas E. Hughes, M.D.

THE OFFICER SANATORIUM

For Diseases of the Lungs and Throat and Tuberculosis in all forms

Sanatorium situated in a pine forest 1900 feet above the sea level on the Cumberland Plateau where we have mild winters and cool, delightful summers. We have no malaria or mosquitoes. New buildings and reasonable rates.

Address

DR. W. C. OFFICER, Medical Director, Monterey, Tenn.

WATAUGA SANITARIUM

Ridgetop, Tenn.

Cottage sanitarium for the treatment of tuberculosis.

Location ideal, elevation 1000 feet. Rates reasonable.

Illustrated booklet on application.

DR. W. S. RUDE, Medical Director

SAINT ALBANS SANATORIUM

RADFORD, VA.

MEDICAL STAFF:
J. C. King, M.D.
John J. Giesen, M.D.

A modern, ethical Institution, fully equipped for the diagnosis, care and treatment of medical, neurological, mild mental and addiction cases. Ideal location, 2000 feet above sea level. Rates reasonable. Railway facilities excellent. Write for full details.

Southern Pediatric Seminar

Next Session at Saluda, N. C., July 26 to August 7

A Two Weeks Post Graduate Course in Latest Methods of Diagnosis, Prevention and Treatment of Diseases of Infants and Children

Six Hours Lecture a Day With Time to Recreate in the "Play Ground of the South;" Beautiful Scenery, Golfing and Boating

Practical Demonstration in the Methods of Feeding Well and Sick Babies

Clinical Material Available; Fifteen Minutes "Round Table" Discussion After Each Lecture

Fifty-five Doctors from the Southern States registered in 1925

The following men from various parts of the South will give courses:

Dr. W. A. Mulherin, A.M., M.D., F.A.C.P., Augusta, Ga., Professor of Clinical Pediatrics, University of Georgia.

Dr. Frank Howard Richardson, M.D., Black Mountain, N. C., Regional Consultant in Pediatrics to New York State Department of Health.

Dr. Lawrence T. Royster, M.D., Charlottesville, Va., Professor of Pediatrics, Medical College of University of Virginia.

Dr. Ross Snyder, M.D., Birmingham, Ala., Professor of Pediatrics, Post-Graduate Department, University of Alabama.

Dr. Owen H. Wilson, M.D., Nashville, Tenn., Professor of Pediatrics, Medical College of Vanderbilt University.

Dr. W. L. Funkhouser, M.D., F.A.C.P., Atlanta, Ga., Professor of Medicine (Pediatrics), Emory University.

Dr. LaBruce Ward, M.D., Visiting Pediatrician to Beallmont Hospital, Asheville, N. C.

Dr. Francis B. Johnson, M.D., Charleston, S. C., Director Clinical Laboratory, Roper Hospital.

Dr. Chas. J. Bloom, M.D., New Orleans, La., Professor of Pediatrics, Tulane Post-Graduate School.

Dr. Wm. Weston, M.D., Pediatrician to Columbia Hospital, Columbia, S. C.

Dr. D. Lesesne Smith, M.D., Saluda, N. C., Director Infants' and Children's Sanitarium, Saluda, N. C.

Dr. Lewis W. Elias, M.D., Visiting Pediatrician to Merrimoth Hospital, Asheville, N. C.

Dr. Oliver W. Hill, M.D., Knoxville, Tenn.

Dr. Philip Barbour, A.M., M.D., F.A.C.P., Professor of Diseases of Children, University of Louisville.

Dr. R. M. Pollitzer, M.D., Greenville, S. C., Professor of Pediatrics, Medical College of South Carolina.

Dr. Robert A. Strong, Hagerstown, Md., former Clinical Professor of Pediatrics, Tulane University School of Medicine.

Dr. G. A. Kempf, Washington, D. C., U. S. Public Health Service (Detailed by Surgeon-General).

Dr. Oren Moore, M.D., F.A.C.S., Charlotte, N. C., Lecturer in Prenatal Care.

Dr. S. H. Welch, M.D., Birmingham, Ala.

Dr. J. B. Greene, A.M., M.D., Asheville, N. C., Lecturer in Oto-Laryngology.

Dr. John D. MacRae, M.D., Asheville, N. C., Instructor in Radiography, U. S. Public Health Service Course, Asheville, N. C.

Dr. O. L. Miller, M.D., F.A.C.S., Director Orthopedic Hospital, Gastonia, N. C.

Dr. E. A. Hines, M.D., Secretary of the South Carolina Medical Association, Seneca, S. C.

Dr. Allen Jervey, M.D., Tryon, N. C., Lecturer in Children's Surgery.

Dr. Antonio Waring, M.D., Savannah, Ga.

Dr. Charles B. Bray, D.D.S., Children Dentistry a Specialty, Special Lecturer in Dentistry, Birmingham, Ala.

Dr. L. G. Beall, M.D., Director Beallmont Sanatorium, Black Mountain, N. C.

Dr. Sam Ravenel, M.D., Greensboro, N. C.

For further information apply to

D. LESESNE SMITH, Registrar
Infants' and Children's Sanitarium, Saluda, N. C.

W. A. Mulherin, Dean,
Augusta, Ga.

Frank Howard Richardson, Vice-Dean,
Black Mountain, N. C.

DR. STOKES SANATORIUM

ALCOHOLISM, DRUG ADDICTION, MENTAL AND NERVOUS DISEASES.

A strictly modern Ethical Sanatorium, fully equipped for the scientific treatment of all nervous and mental affections. Rates, $25.00 per week and upwards. This includes private room, board, general nursing, tray service and medical supervision. Separate apartments for male and female patients. Our treatment for Alcoholics is one of Gradual Reduction and Elimination which destroys the craving for alcohol. Our drug treatment is one of Gradual Reduction which builds the patient up physically while being reduced, restores their appetite and sleep and relieves their constipation. We recommend routine examinations in all cases. Location retired and accessible. Long distance phone: East 1488.

Hydro Therapy, Electro Therapy, Occupational Therapy, Laboratory Facilities

T. N. WILLIS, M.D., Resident Physician E. W. STOKES, M.D., Superintendent

923 Cherokee Road, LOUISVILLE, KENTUCKY

VAUGHAN MEMORIAL HOSPITAL

SELMA, ALABAMA

Private General Hospital—Group System

On A. C. S. list of Approved Hospitals

STAFF

Dr. F. G. DuBose, Dr. C. C. Elebash, Dr. D. H. Doherty, Dr. W. W. Burns, Dr. S. Kirkpatrick, Dr. J. S. Chisolm and Associates. Miss Ruth Davis, R. N., Supt.; Miss P. Davis, R. N., Asst. Supt.; Miss Ruby Davis, Technician; Miss Juliette Hamilton, Dietitian; Miss G. Davis, Gen'l. Sec'y.; Miss E. Neely, Historian; Miss V. Parton, R. N., Instructress of Nurses; Miss S. Lamkin, R. N., Surgical Nurse.

DEPARTMENTS: Surgery, Gynecology, Obstetrics, Urology, Medicine, Pediatrics, Eye, Ear, Nose and Throat, Radiology and X-Ray.

HARLEM LODGE

Catonsville, Md.

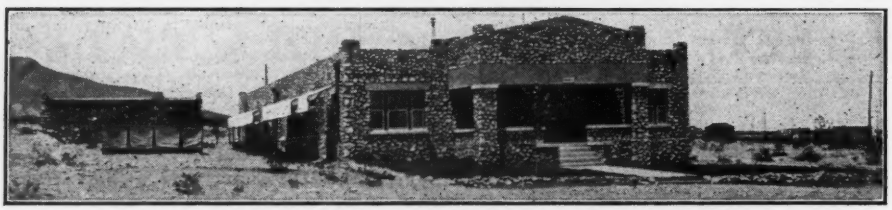
A private sanitarium for mental and nervous invalids giving intimate care amid pleasant surroundings. The best methods of treatment are used, including occupational therapy.

No alcoholics or drug addicts received.

Applications for admission should be addressed to the Medical Director,

Dr. Wm. Rush Dunton, Jr.,

Harlem Lodge, -:- Catonsville, Md.



THE PRICE SANATORIUM

FOR TUBERCULOSIS
EL PASO, TEXAS

A high-class, modern, new institution for the treatment of all forms of tuberculosis; all approved methods of treatment used. Dry mountain climate, altitude 4000 feet, rainfall 9.12 inches; 335 sunshiny days, average humidity .40.

Rates, private room and porch, $22.50 to $30.00 per week. Quartz light therapy. Booklet on request. Address

E. D. PRICE, M.D., Medical Director 204 Roberts Banner Bldg., El Paso, Tex.

HILL CREST SANITARIUM

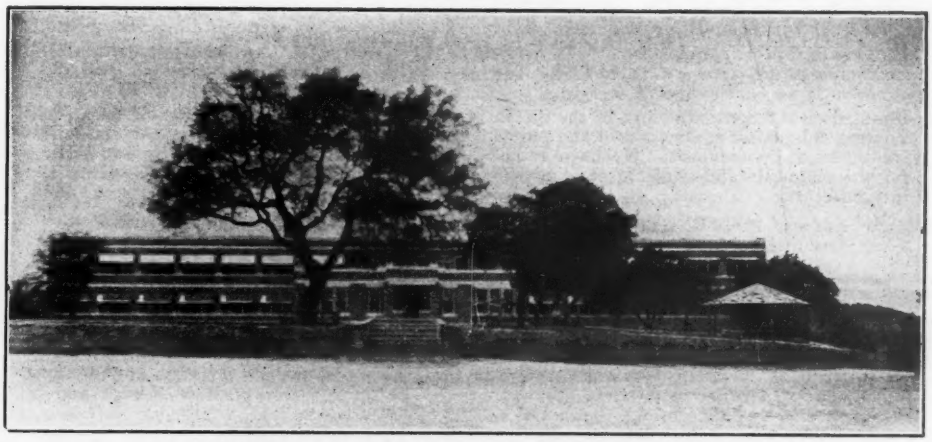
FOR NERVOUS AND MENTAL DISEASES
AND SELECTED CASES OF ADDICTION

Hill Crest Sanitarium is ideally located on the crest of Higdon Hill on the proposed Scenic Highway overlooking the City. All modern conveniences. Several acres of well shaded lawn. Adequate nursing service maintained.

Consultants: B. L. Wyman, M.D., H. S. Ward, M.D., C. M. Rudulph, M.D.

JAS. A. BECTON, M.D., Resident Physician. 67th St. So. and Higdon Ave., Birmingham, Ala.

SAM E. THOMPSON, M.D. H. Y. SWAYZE, M.D. WM. R. FICKESSEN, M.D.



Main Building. There are 36 Cottages with Modern Conveniences

THE THOMPSON SANATORIUM

FOR THE TREATMENT AND EDUCATION OF
TUBERCULOUS PATIENTS

KERRVILLE X-Ray and Laboratory Graduate Nurses TEXAS

Ideal all year climate. Seventy-five miles northwest of San Antonio—1400 feet higher

CURRAN POPE, M. D.

The Pope Hospital, Inc.

Louisville, Kentucky

A MODERN HOSPITAL
COMPLETE EQUIPMENT

SCIENTIFIC DIAGNOSIS
EVERY FORM OF THERAPY

Hydrotherapy
Electrotherapy
Galvanic
Sinusoidal
Static

Thermotherapy
Mechanotherapy
Faradic
High Frequency
Diathermy

Mechanical Vibration and Swedish Movements **All Forms of Light**

Has Specialized for 35 Years
in
1890—NEUROLOGY and INTERNAL MEDICINE—1925

Does not treat the Insane, Morphine, Alcoholic or Objectionable Cases

ILLUSTRATED LITERATURE ON REQUEST

POTTENGER SANATORIUM, Monrovia, California

For Diseases of the Lungs and Throat

F. M. Pottenger, A.M., M.D., LL.D., Med. Director

J. E. Pottenger, A.B., M.D., Asst. Med. Director and Chief of Laboratory

Situated on the Southern slope of the Sierra Madre Mountains at an elevation of 1,000 feet. Winters delightful; summers cool and pleasant. Thoroughly equipped for the scientific treatment of tuberculosis. We have established, in connection with the Sanatorium, a clinic for the diagnosis and study of such non-tuberculous diseases as asthma, lung abscess and bronchiectasis.

Address POTTENGER SANATORIUM, Monrovia, California, for particulars.
Los Angeles Office: 1045-7 Title Insurance Building, 5th and Spring Streets.

ALBUQUERQUE SANATORIUM

Located in the heart of the great Southwest, the Land of Sunshine. Average annual rainfall 7 inches. Altitude moderate. Albuquerque is the largest city in New Mexico and is served by the main line of the Santa Fe.

The open-air hygienic treatment of Tuberculosis is supplemented by artificial Pneumothorax and X-Ray Therapy under the direction of a staff of 5 physicians specially trained in Internal Medicine. Special facilities for Sun Baths.

Private sleeping-porches, baths, bungalows and modern fire-proof buildings.

On request information will be given concerning accommodations available.

W. A. GEKLER, M. D., Medical Director

A. L. Hart, M.D. **H. P. Rankin, M.D.** **B. J. Weigel, M.D.**

Clinic Offices and Laboratories *Hotel Gorgas* *Nurses' Home*

HOTEL GORGAS

Owned and operated by the Seale Harris Clinic, planned and constructed to care for the sick and convalescent cases in which diet is an important factor in treatment. A six-story reinforced concrete and fire-proof brick building, containing 60 rooms, 36 with private baths, providing the comforts and many of the features of a resort hotel and the equipment of a modern hospital. Patients under observation for diagnosis, relatives of patients and visiting physicians, in addition to patients not requiring hospital care, can be given hotel accommodations.

Operating suite, cystoscopic room, and departments of electrotherapy, hydrotherapy, massage and Swedish exercises, and other forms of physiotherapy. The sixth floor will be given over entirely to the dining room and for recreation, with palm room, reading room, solarium, terraces and pergola.

A distinctive feature of the Hotel Gorgas will be the instruction of all patients, in groups and individually, in food values and vitamins, physical exercises, mental hygiene, oral hygiene, and in other matters pertaining to personal health. Special courses of instruction on diet and the use of insulin in diabetes will be given to diabetics and to physicians.

For further information address

DR. SEALE HARRIS
DR. J. P. CHAPMAN
DR. W. S. GEDDES

THE SEALE HARRIS CLINIC
Highland Avenue
BIRMINGHAM, ALABAMA

THE TUCKER SANATORIUM, Inc.

Madison and Franklin Streets
RICHMOND, VIRGINIA

This is the Private Sanatorium for the Neurological Practice of Drs. Beverley R. Tucker and R. Finley Gayle

The Tucker Sanatorium is for the treatment of nervous diseases. Insane and acute alcoholic cases are not taken. The Sanatorium is large and bright, surrounded by a lawn and shady walks and large verandas. It is situated in the best part of Richmond and is thoroughly and modernly equipped. There are departments for massage, medicinal exercises, hydrotherapy, occupation and electricity. The nurses are especially trained in the care of nervous cases.

VON ORMY COTTAGE SANATORIUM **For the Treatment of Tuberculosis**
VON ORMY, TEXAS

W. R. GASTON, Manager F. C. COOL, Assistant Manager R. G. McCORKLE, M.D., W. C. FARMER, M, D., } Medical Directors.

Ideally located near San Antonio, Texas. An institution that offers the proper care of tuberculous patients at moderate rates. For Booklet and other information please address the Manager.

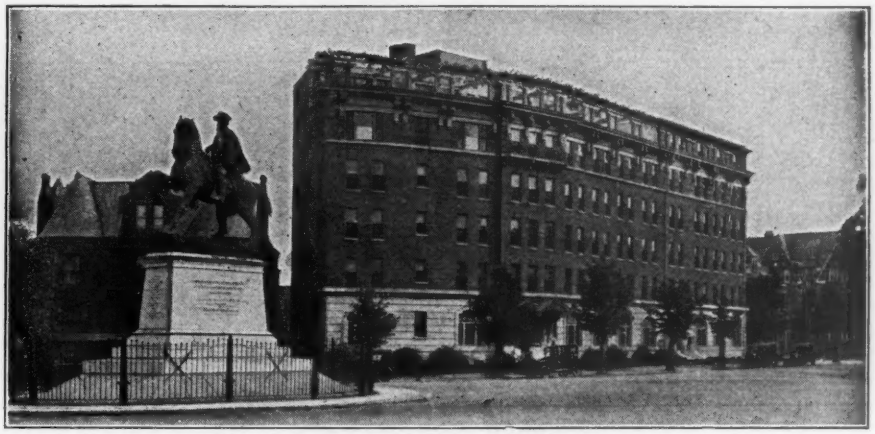
WALTER R. WALLACE, M.D. HUGH W. PRIDDY, M.D.

THE WALLACE SANITARIUM
MEMPHIS, TENN.

(SUCCEEDING THE WALLACE-SOMERVILLE SANITARIUM)

For the Treatment of Drug Addictions, Alcoholism, Mental and Nervous Diseases
Located in the Eastern Suburbs of the City—Sixteen Acres of Beautiful Grounds
All Equipment for Care of Patients Admitted

STUART CIRCLE HOSPITAL, Richmond, Va.

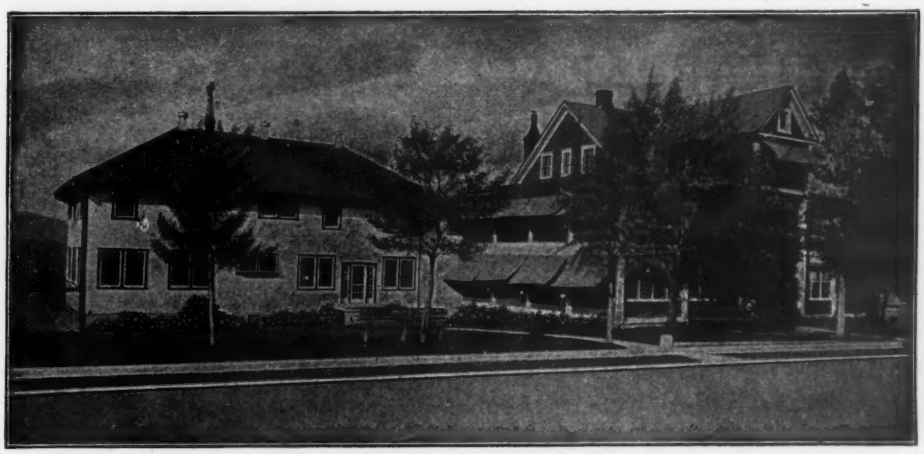


STAFF

General Surgery:	Obstetrics:	Internal Medicine:	Ophthalmology, Oto-Laryngology
Stuart N. Michaux, M.D.	Greer Baughman, M.D.	Alex G. Brown, Jr., M.D.	Clifton M. Miller, M.D.
Charles R. Robins, M.D.	Ben H. Gray, M.D.	Manfred Call, M.D.	R. H. Wright, M.D.

With consulting offices for the staff, laboratories, surgical and obstetrical operating rooms, equipment for the treatment of medical cases and a training school for nurses, the STUART CIRCLE HOSPITAL is a modern standardized hospital for private patients.

CHARLOTTE PFEIFFER, R. N., Superintendent.



Mount Regis Sanatorium

SALEM (Incorporated) VIRGINIA

Twixt the Alleghany and Blue Ridge Mountains of Virginia

A modern, thoroughly equipped, private institution for the treatment of early and moderately advanced tuberculosis.

Complete Laboratory Equipment, X-Ray, Alpine Sun Lamp, Artificial Pneumothorax. Physicians in constant attendance. Training School for Nurses with affiliation with general hospital.

EVERETT E. WATSON, M.D.,
CHURCHILL ROBERTSON, M.D., } Physicians in Charge.

E. W. PAGE, Business Manager,
MISS ORA WIGFIELD, Supt. of Nurses.

Descriptive booklet on request.

Yarbrough's Dietetic Sanatorium

21 South Jackson St.
MONTGOMERY, ALABAMA

CHRONIC DISEASES ONLY

Chronic Dysentery Chronic Diarrhoea Nervous Indigestion Gastric Ulcer
"Bright's Disease" High Blood Pressure Chronic Rheumatism
Ideal Environment for Nervous Patients
Pellagrins in Separate Building. No Infectious Cases Accepted.
Adequate Night Nursing Staff Maintained. Rate Reasonable.
Highest Elevation in the City, Above Noise of Traffic. Two Blocks East of Capitol.

WM. RAY GRIFFIN, M.D. M. A. GRIFFIN, M.D.

APPALACHIAN HALL

ASHEVILLE, N. C.

For the Treatment of Nervous Diseases

Located in a beautiful park of twenty-five acres, in one of the famous all-the-year-round health resorts of the world, where climate, air, water and scenery are unsurpassed. Five separate buildings, thoroughly modern, afford ample facilities for the classification and separation of patients.

Treatment is limited to Nervous and Mental Diseases, Selected Cases of Alcoholic and Drug Habituation.

Hydro-therapy, Electro-therapy, Occupational-therapy and Massage extensively used. The two physicians in charge reside in the Institution and devote their entire time to the care and treatment of the patients.

For information and booklet write Drs. Griffin and Griffin.

CITY VIEW SANITARIUM

(Established 1907)

For MENTAL and NERVOUS DISEASES and ADDICTIONS

Moved to its new location July 1, 1922
An entirely new plant has been erected

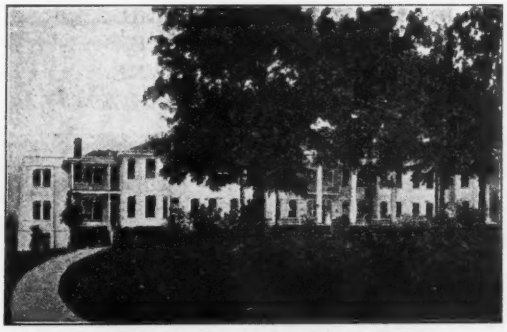
Separate buildings for men and women, ideally arranged and equipped with every facility for the comfort, care and treatment of the class of patients received. Situated in the midst of a fifty-acre tract, and surrounded by large grove and attractive lawns. Two resident physicians. Training school for nurses.

References: The medical profession of Nashville

JOHN W. STEVENS, M.D., Physician-in-Charge
R. F. D. No. 1

NASHVILLE TENNESSEE

On Murfreesboro Pike, one-half mile east of old location.



BRAWNER'S SANITARIUM

ATLANTA, GEORGIA

A modern neuropsychiatric hospital with special laboratory facilities for the study and treatment of early cases. Also a department for the treatment of drug and alcoholic addictions.

The Sanitarium is located on the Marietta Electric Car Line ten miles from the center of Atlanta, near Smyrna, Ga. The grounds comprise 80 acres. The buildings are steam heated, electrically lighted, and many rooms have private baths.

Address communications to Brawner's Sanitarium, Smyrna, Ga., or to the city office, 79 Forrest Avenue, Atlanta, Ga.

Dr. Jas. N. Brawner, Medical Director.

Dr. Albert F. Brawner, Resident Physician.

ARLINGTON HEIGHTS SANITARIUM

P. O. BOX 978, FORT WORTH, TEXAS

For Nervous Diseases and Selected Cases of Mental Diseases.

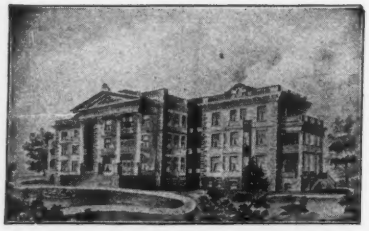
(Incorporated under laws of Texas)

BRUCE ALLISON, M. D.
Superintendent

JAS. D. BOZEMAN, M. D.
Resident Physician

DRS. W. L. ALLISON and JNO. S. TURNER
Consultants

WAUKESHA SPRINGS SANITARIUM



For the Care and Treatment of
NERVOUS DISEASES
Building Absolutely Fireproof

BYRON M. CAPLES, M.D.,
Medical Director
FLOYD W. APLIN, M.D.
L. H. PRINCE, M.D.
Waukesha, - - Wisconsin

THE HENDRICKS - LAWS SANATORIUM

El Paso, Texas

Chas. M. Hendricks, James W. Laws,
Medical Directors

A modern and thoroughly equipped private institution for the treatment of all forms of tuberculosis, located at an ideal point, where atmospheric conditions approach perfection in the treatment of such disorders. For full information, address T. B. Craft, Business Manager.

Altitude 4,000 feet. Percentage of Humidity .40
335 Sunny Days. Average Rainfall 9.12 inches.

THE MARTIN CLINIC

Dugan-Stuart Bldg.
HOT SPRINGS, ARKANSAS

DR. E. A. PURDUM
Chief of Staff
DR. W. G. KLUGH
DR. W. F. PORTER
DR. P. Z. BROWNE
DR. C. W. JENNINGS
W. J. FORD
Roentgenology
C. W. ABEL
Clinical Pathology

OXFORD RETREAT

OXFORD, OHIO

Nervous and Mental Diseases
Alcohol and Drug Addictions
FOR MEN AND WOMEN

96 Acre Lawn and Forest, Buildings Modern and First Class in all Appointments. Thoroughly Equipped. Of Easy Access—39 Miles from Cincinnati, on C. H. & D. R. R. 16 Trains Daily

THE PINES

An Annex for Nervous Women
Write for Descriptive Circular
HARVEY COOK, M.D., Physician-in-Chief

CHESTNUT LODGE

ROCKVILLE, MARYLAND

Near Washington, D. C. Baltimore & Ohio Railroad and Electric Line from Washington

This sanitarium under experienced management offers superior advantages for the treatment of patients suffering from Nervous and mild Mental Diseases, and for elderly persons needing skilled care and nursing; combining the equipment of a modern Psychopathic Hospital with the appointments of a refined home. The Hydrotherapy Department is complete in every detail, including the Nauheim Baths for Arteriosclerosis, Heart and Kidney Diseases.

DR. E. L. BULLARD, Physician-in-Charge
DR. DEXTER M. BULLARD, Assistant Physician

THE WINYAH SANATORIUM

OPERATED BY THE VON RUCK MEMORIAL SANATORIUM, Inc.
Established in 1888 by Dr. Karl von Ruck
ASHEVILLE, N. C.

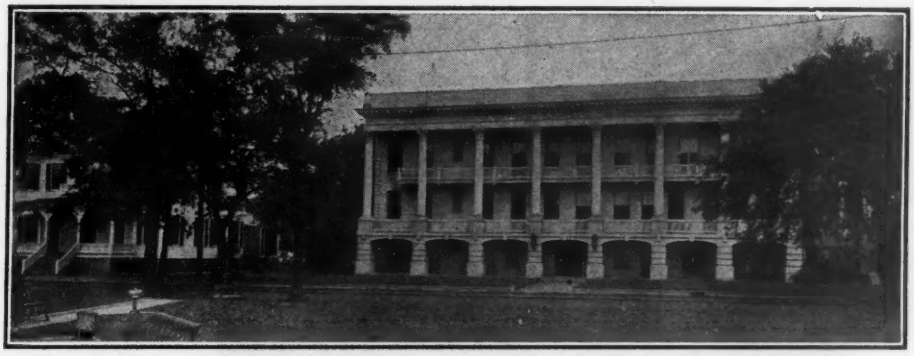
Medical Staff: Dr. R. E. Flack, Dr. Edw. W. Schoenheit, Dr. Louis Dienes

A modern and completely equipped institution for the treatment of tuberculosis. High-class accommodations. Strictly scientific methods. For particulars and rates write to

WM. A. SCHOENHEIT,
Business Manager.

(Please mention this Journal)

INGE-BONDURANT SANATORIUM MOBILE, ALABAMA



Beautifully and conveniently located opposite Ryan Park

Neuropsychiatry and Internal Medicine
Dr. E. D. Bondurant, Dr. E. S. Sledge

Surgery
Dr. F. M. Inge

A private general hospital. Specially equipped for and adapted to the diagnostics and treatment of neuropsychiatric and internal medical conditions. Adequate facilities for surgical and obstetrical cases. Complete radiologic, clinical pathologic, physiotherapy and dietetic departments. Troublesome insane or otherwise objectionable patients not received.

W. H. THOMPSON, Radiologist and pathologist **MRS. A. M. NABORS, Dietitian**
STANDARD TRAINING SCHOOL FOR NURSES **MISS MINNIE KRUGER, R.N., SUPERINTENDENT**

The Cincinnati Sanitarium

Inc. 1873

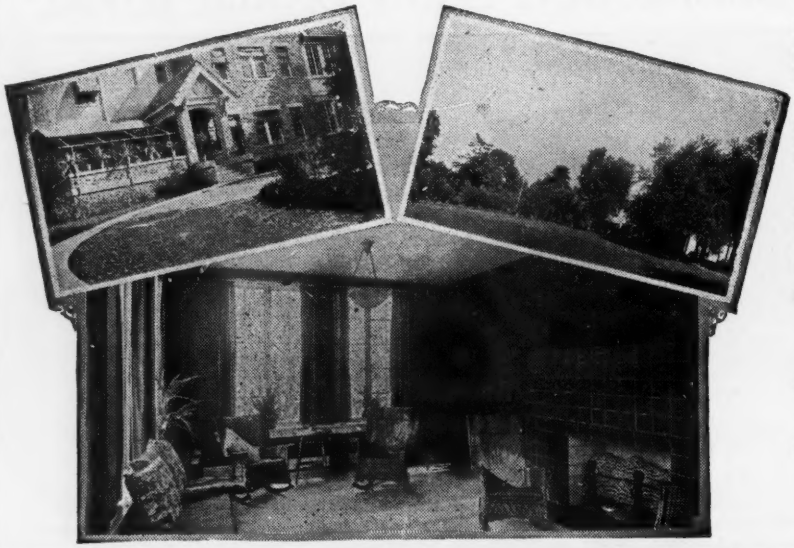
For Mental and Nervous Diseases. A strictly modern hospital fully equipped for the scientific treatment of nervous and mental affections. Situation retired and accessible. For details write for descriptive pamphlet.

F. W. Langdon, M.D.,
Robert Ingram, M.D.,
Visiting Consultants

D. A. Johnston, M.D.,
Medical Director

H. P. COLLINS, Business Manager
Box No. 4, College Hill
CINCINNATI, OHIO

"REST COTTAGE" College Hill, Cincinnati, Ohio



For purely nervous cases, nutritional errors and convalescents.

Completely equipped for hydrotherapy, massages, etc.

Cuisine to meet individual needs.

F. W. Langdon, M. D.
Robert Ingram, M. D.
Visiting Consultants.

D. A. Johnston, M.D., Medical Director.

H. P. Collins, Bus. Mgr., Box No. 4, College Hill, Cincinnati, Ohio

LYNNHURST SANITARIUM

FOR NERVOUS DISEASES AND MILD MENTAL DISORDERS

Situated in the suburbs of Memphis in a natural park comprising 28 acres of beautiful woodland and ornamental shrubbery. Modern and approved methods in construction and equipment. Sanitary plumbing, low-pressure steam heat, electric light, fire protection and an abundance of pure water. The elegance and comforts of a well appointed home. Rooms single or en suite with private bath. Facilities for giving Hydrotherapy, Electrotherapy, Massage, Physical Culture and Rest Treatment. Experienced nurses and house Physician. An improved treatment for Opium-Morphin Addiction.

S. T. RUCKER, M. D., Director Medical Department

Memphis, Tenn. **Bell Telephone Connections**

KENILWORTH SANITARIUM

(Established 1905)

KENILWORTH, ILLINOIS

C. & N. W. Railway, 6 miles North of Chicago

Built and equipped for the treatment of nervous and mental diseases. Approved diagnostic and therapeutic methods. An adequate night nursing service maintained. Sound-proofed rooms with forced ventilation. Elegant appointments. Bath rooms en suite, steam heating, electric elevator, electric lighting.

Resident Medical Staff:

SHERMAN BROWN, M. D.
MABLE HOILAND, M. D.
SANGER BROWN, M. D.

Consultation by appointment only

All correspondence should be addressed to Kenilworth Sanitarium, Kenilworth, Ill.

HOLY CROSS SANATORIUM FOR TUBERCULOSIS

DEMING, NEW MEXICO

Modern, thoroughly equipped Sanatorium for the Scientific Treatment of all forms of Tuberculosis and Diseases of the Chest.

Moderate climatic conditions and an altitude of 4330 feet make it ideal for the tuberculosis patient.

Individual rooms (with or without private bath). Private sleeping porches of the most approved design.

Garden, dairy and poultry yard in connection with the institution.

Direction of Sisters and Physicians especially trained in the care of Tuberculosis.

Rates, $25 to $50 a week, include room, board, general nursing and medical care. Wards, $14 to $20.

For further information address

SISTER SUPERIOR or F. D. VICKERS, M.D., Medical Director.

Westbrook Sanatorium, Richmond, Virginia

THROUGH THE MEDICAL STAFF,

DOCTORS JAS. K. HALL, P. V. ANDERSON AND E. M. GAYLE

WISHES TO ANNOUNCE TO THE PROFESSION THE OPENING OF AN ADDITION TO THE INSTITUTION OF TWO BRICK BUILDINGS—ONE FOR MEN AND ANOTHER FOR WOMEN.

THE PLANT now consists of nine separate buildings situated in the midst of grounds which embrace eighty-five acres. The lawn is large and beautifully shaded; there are private walks and drives, and the institution affords the quietness and serenity of the country within sight of the city.

Rooms may be had single or en suite, with or without private baths. Small cottages, suitable for one patient, are also available.

Treatment is limited to Nervous Disorders, mild Mental Affections, and to Alcoholic and Drug Habituation. Nurses and attendants are trained for this special work and the Sanatorium furnishes every facility for the rational treatment of such patients.

Life in the out-of-doors, combined with properly selected work for each patient, constitutes an important therapeutic measure.

The three physicians live at the Sanatorium and devote their entire attention to the patients.

BOOKLET UPON REQUEST

DR. MOODY'S SANITARIUM

SAN ANTONIO, TEXAS

For Nervous and Mental Diseases, Drug and Alcohol Addiction and Nervous Invalids Needing Rest and Recuperation.

Established 1903. Strictly ethical. Location delightful summer and winter. Approved diagnostic and therapeutic methods. Modern clinical laboratory. Seven buildings, each with separate lawns, each featuring a small separate sanitarium, affording wholesome restfulness and recreation, in doors and out doors, tactful nursing and homelike comforts. Bath rooms en suite, 100 rooms, large galleries, modern equipment, 15 acres, 350 shade trees, cement walks, playgrounds. Surrounded by beautiful park, Government Post grounds and Country Club.

T. L. MOODY, M.D.,
Supt. and Res. Physician.

J. A. McINTOSH,
Res. Physician.

Florida Sanitarium and Hospital

Orlando, Florida

One of the forty like institutions conducted by Seventh-day Adventists. Service scientific and efficient. Equipment modern. Location ideal—overlooking beautiful lake. Climate delightful, cool in summer, warm in winter.

Tuberculous and contagious diseases barred. Battle Creek methods. Laboratory facilities efficient. X-Ray, actinic ray, electricity in its various forms, hydrotherapy and massage. Rates moderate. For information and booklet write

DR. L. L. ANDREWS,
Medical Superintendent.

MISS QUINN'S NURSING HOME

FOR PATIENTS WHO REQUIRE

REST AND PRECISION IN DIET

930 South 20th St.
BIRMINGHAM, ALA.

In connection with offices of Dr. James S. McLester.

Hospital For General Diagnosis and Nervous Diseases

"NORWAYS"

1820 E. 10th Street, Indianapolis, Ind.

An institution devoted to the Research, Study and Diagnosis of all problems in Medicine and Surgery, especially of conditions involving the Nervous System. All newer methods of Diagnosis, particularly the Chemistry of the blood, spinal fluid, secretions and excretions of the body are employed. The importance of the body metabolism and its relation to diseased conditions is emphasized.

The co-operation of physicians is invited. It is the policy of the Hospital to return patients to their home and family physician for treatment, at the earliest possible moment, after diagnosis is made. Only at the request of the patient's physician will any case be kept in the Hospital beyond the necessary period of observation.

A complete staff of skilled specialists in co-operation.

For further particulars regarding rates, etc., write

DR. ALBERT E. STERNE or
DR. LARUE D. CARTER

"Norway" Hospital for General Diagnosis and Nervous Diseases.

THE TORBETT SANATORIUM AND DIAGNOSTIC CLINIC

With the Majestic Hotel and Bath House and the Bethesda Bath House.

Three thoroughly modern institutions under the same roof. All recognized methods of physiotherapy, dietetics, x-ray, and laboratory are utilized. A graduate experienced physician in charge of each department aided by trained nurses and assistants. Water similar in composition and properties to the famous Carlsbad. We also have a chartered Nurses' Training School emphasizing Physiotherapy.

Staff

J. W. Torbett, B.S., M.D., Supt., Diagnosis and Internal Medicine.
O. Torbett, Ph. G., M.D., Asst. Supt., Diagnosis and Internal Medicine.
Edgar P. Hutchings, M.D., Eye, Ear, Nose and Throat.
J. B. White, Ph. C., M.D., Urology and Syphilology.
F. A. York, M.D., Roentgenology and Gastro-Enterology.
Howard Smith, M.D., Physician and Surgeon.
S. A. Watts, M.D., Internist.
Cromwell Rogers, M.D., Pathology.
S. P. Rice, M.D., M. A. Davidson, M.D., Obstetrics and General Practice.
H. H. Robertson, D.D.S.
Miss Sarah Kirvin, R.N., Supt. of Nurses & Dietetics.
Miss Mary Valigura, R.N., Supt. Surgical Dept. and Physiotherapy.

For further information, write for folder to
TORBETT SANATORIUM, MARLIN, TEXAS

THE STEWART HOME TRAINING SCHOOL, Frankfort, Ky.

For the Care and Training of MENTALLY DEFECTIVE CHILDREN

Expert training, mental development and care by specially trained teachers, nurses and physician who has devoted his life to the study and treatment of cases of arrested mental development.

Delightfully located in the beautiful blue grass region of Kentucky. Five hundred acres of lawn and woodland for pleasure grounds. Seven elegantly appointed buildings, electrically lighted and steam heated. Highly endorsed by prominent physicians. Write for descriptive catalogue. Address

DR. JOHN P. STEWART
Box M, Frankfort, Ky.

WASHINGTON RADIUM AND X-RAY LABORATORY

1610 20TH STREET NORTHWEST
WASHINGTON, D. C.

Phone North 6687-3457

C. AUGUSTUS SIMPSON, M.D. H. F. ANDERSON, M.D.

DERMATOLOGY
RADIUM AND X-RAY THERAPY

Radium in sufficient quantity to treat any form of malignancy at our disposal. Massive X-Ray Therapy. Fulguration. Kromayer and Alpine lamps in skin lesions.

Glenwood Park Sanitarium, Greensboro, North Carolina

SUCCEEDING TELFAIR SANITARIUM

The Glenwood Park Sanitarium is ideally located in a quiet suburb of Greensboro, having all the advantages of the city, yet sufficiently isolated to enable our patients to enjoy restful quietude and entire freedom from the noise and distraction incident to city life.

CLASS OF PATIENTS—Those who need help to overcome the bondage of habit. Rest from overwork, study or care. Diversions for the depressed and disquiet mind—and such as are suffering from any disease of the nervous system. The treatment consists of the gradual breaking up of injurious habits, and the restoration to normal conditions by the use of regular and wholesome diet, pure air, sunlight, and exercise, with such other remedies as are calculated to assist nature in the work of restoration.

Special attention is given to the use of electricity. Twenty years' experience has proven it invaluable in cases of nervous prostration, incipient paralysis, insomnia, the opium and whiskey habit, and those nervous affections due to uterine or ovarian disorders.

For further particulars and terms, address W. C. ASHWORTH, M.D., Superintendent.

South Mississippi Infirmary

Established 1901
Standardized

GENERAL HOSPITAL

RADIUM AND X-RAY CLINIC

W. W. CRAWFORD, M.D.
Surgeon-in-Chief

HATTIESBURG, MISSISSIPPI

DRS. KEITH & KEITH

746 Francis Bldg. Louisville, Ky.

Modern equipped X-Ray Laboratories
at
Office and Hospitals for
Diagnosis and Therapy

An ample supply of Radium
for the treatment of superficial and deep lesions in which radium is indicated.

J. PAUL KEITH D. Y. KEITH

X-RAY AND CLINICAL LABORATORIES

Radium and Deep
X-Ray Therapy
Dermatology

DRS.
MARCHBANKS & CROWELL

527-535 Volunteer Bldg.,

CHATTANOOGA, TENNESSEE

St. Elizabeth's Hospital
RICHMOND, VA.

Staff

J. Shelton Horsley, M.D.,
Surgery and Gynecology
J. S. Horsley, Jr., M.D.,
Surgery and Gynecology
Wm. H. Higgins, M.D., Internal Medicine
O. O. Ashworth, M.D., Internal Medicine
Austin I. Dodson, M.D., Urology
Fred M. Hodges, M.D., Roentgenology
Helen Lorraine, Medical Illustration
Thos. W. Wood, D.D.S., Dental Surgery

Administration

N. E. Pate .....Business Manager

SCHOOL FOR NURSES

All applicants must be graduates of a high school or must have equivalent education.

Address
HONORIA MOOMAW, R.N.,
Superintendent of Hospital and Principal of Training School.

COLORADO FOR TUBERCULOSIS

STAR RANCH-IN-THE-PINES

Modern, thoroughly equipped Sanatorium for treatment of tuberculosis in all its forms.

Cool, invigorating mountain air, pleasant surroundings, with the best of care, are important aids to early recovery.

Oxyperitoneum, Artificial Pneumo-thorax, Heliotherapy, Autogenous Vaccines, etc., used when indicated.

Rates $20 to $35 per week. Write or wire Supt. for Accommodations or Literature.

T. WIGMAN, Jr., Supt.
P. O. Box 1037 S

W. C. HOWELL, M. D., Med. Dir.
Colorado Springs, Colo.

THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA

One Hundred and Second Annual Session Begins September 22, 1926, and Ends June 3, 1927

FOUNDED 1825. A CHARTERED UNIVERSITY SINCE 1838. Graduates number 14,625, nearly 6,000 of whom are active in medical work in every State, and many foreign countries.

FACILITIES: Well equipped laboratories; separate Anatomical Institute; teaching museums; free libraries; unusual and superior clinical opportunities in the Jefferson Hospital, Jefferson Maternity, and Department for Diseases of the Chest. A sixteen-story addition to the Jefferson College Hospital, containing the new Clinical Amphitheater, the Maternity Department and the new Clinical Laboratories, was opened in November, 1924. These buildings are all owned and controlled by the College. Instruction privileges in six other hospitals.

FACULTY: Eminent medical men of national reputation and unusual teaching ability.

ADMISSION: Not less than two college years leading to a degree in science or art, including specified science and language courses. Preference is given to those who have completed additional work.

APPLICATIONS should be made early.

ROSS V. PATTERSON, M.D., Dean.

RADIUM THERAPY

in connection with

NEWELL & NEWELL Sanitarium

705-707 Walnut St., Chattanooga. Tenn.

An ample supply of Radium for the treatment of all conditions in which Radium is indicated.

SANITARIUM STAFF

E. T. Newell, B.S., M.D.
E. D. Newell, B.S., M.D.
J. Marsh Frere, M.D.
E. R. Campbell, B.S., M.D.
J. J. Armstrong, B.S., M.D.
W. H. York, B.A., M.D.
J. S. Bobo, M.D.

RADIUM AND X-RAY LABORATORY

in Connection With

DRS. GAMBLE BROS., MONTGOMERY & CO.

Greenville, Miss.

A thoroughly equipped X-Ray Laboratory and an ample supply of Radium for the treatment of all conditions in which Radium is indicated.

Address all communications to

DR. ROBT. C. FINLAY, Director

Greenville, Miss.

EMORY UNIVERSITY
SCHOOL OF MEDICINE

Seventy-Second Annual Session Begins September 29, 1926

ADMISSION—Four years of work in an accredited high school and two years of college credits in Physics, Biology, Chemistry, English, and modern foreign language. The pre-medical course may be taken in the College of Liberal Arts at Emory University, Georgia, or in any acceptable college or university.

COMBINATION—A student presenting credits for three years of pre-medical work from the College of Liberal Arts of Emory University can, upon the completion of his freshman year in medicine with an average grade of "C," obtain the degree of Bachelor of Science, gaining his M.D. degree at the close of his senior year in medicine.

INSTRUCTION—Thorough laboratory training and systematic clinical teaching are special features of this institution. The faculty is composed of 127 professors and instructors, eighteen of whom are full-time salaried men.

EQUIPMENT—Five large new modern buildings devoted exclusively to the teaching of medicine. Well equipped laboratories and reference library.

HOSPITAL FACILITIES—The negro division of Grady (municipal) Hospital, with a capacity of 220 beds, is in charge of the faculty for the entire year. The new Wesley Memorial Hospital on the University Campus, erected at a cost of approximately $1,500,000, and accommodating 200 ward and teaching patients and 100 private patients, is now an integral part of the University. The J. J. Gray out-patient department, averaging 4,000 visits per month, affords excellent facilities for clinical instruction.

RATING—This school has a Class A rating, and is a member of the Association of American Medical Colleges.

Catalogues and application blanks may be obtained by applying to Russell H. Oppenheimer, M.D., Dean, 50 Armstrong Street, Atlanta, Ga

UNIVERSITY OF LOUISVILLE
SCHOOL OF MEDICINE

Eighty-ninth Annual Session will begin September 13, 1926. Entrance requirements those of standard Class A schools. Six or seven year combination courses recommended, both given in conjunction with the College of Liberal Arts of the University of Louisville.

The modern 400-bed City Hospital is affiliated with the School of Medicine. All beds are charity and a Dispensary of about 60,000 visits annually is maintained. In this institution, for all professional activities of which the University is responsible, more than half the teaching is done. Modern laboratories maintained by the University. Paid teachers in medicine, surgery, pediatrics and obstetrics form the nucleus of the staff for twelve months of the year.

New edition of the current catalogue gives full information. Early application urged, as classes are limited to seventy-five, sixty-four, sixty and sixty.

For further information, address the Dean,

101 W. Chestnut Street,
Louisville, Ky.

The Tulane University
of Louisiana

GRADUATE SCHOOL of MEDICINE

Reorganized to meet the requirements of the Council on Medical Education of the A.M.A., and new men added to the Faculty in every department.

The fortieth session begins on Monday, October 18, 1926, with a four weeks' clinical course which will be followed by four courses of six weeks each of clinical and didactic work, and the school will close with a four weeks' clinical course ending June 4, 1927.

In addition to the short courses which have been arranged to cover the work in each department in a systematic and intensive manner, courses leading to a degree have also been instituted.

For information address

Dean, Graduate School of Medicine
1551 Canal Street New Orleans

New York Post-Graduate
Medical School and Hospital

OFFERS COURSES IN

☐ Medicine	☐ Operative Surgery	☐ Urology	☐ Otology
☐ Pediatrics	☐ Orthopedic Surgery	☐ Gynecology	☐ Laryngology
☐ Surgery	☐ Traumatic Surgery	☐ Roentgenology	☐ Pathology

Name ..... Address .....

Check the subjects which interest you and return with your name and address to the

DEAN, 306 East Twentieth Street.....New York City.

POST GRADUATE COURSES
In All Branches For
PHYSICIANS AND
SURGEONS

LABORATORY AND X-RAY
TRAINING FOR PHYSICIANS
AND TECHNICIANS

Graded Courses in
EYE, EAR, NOSE AND
THROAT

For Further Information Address

POST GRADUATE HOSPITAL AND MEDICAL SCHOOL
2400 S. Dearborn St. Chicago, Illinois.

Medical College of Virginia
UNIVERSITY COLLEGE OF MEDICINE
MEDICAL COLLEGE OF VIRGINIA
(Consolidated)

Medicine-Dentistry-Pharmacy
STUART McGUIRE, M.D., Dean

New college building, completely equipped and modern laboratories. Extensive Dispensary service; hospital facilities furnish 400 clinical beds; individual instruction; experienced faculty; practical curriculum. For catalogue of information address

J. P. McCAULEY, Secretary
1149 E. Clay Street Richmond, Va.

The New York Skin and Cancer Hospital
SPECIAL POST GRADUATE INSTRUCTION
For Graduates In Medicine
Will be given as follows

1—Hospital and Dispensary instruction, diagnosis and treatment of diseases of the skin.
2—Instruction in syphilis—diagnosis, laboratory work and treatment.
3—Instruction in X-ray Therapy.
4—Laboratory instruction in the pathology of skin diseases and new growths, including clinical methods for the demonstration of the commoner parasites.
5—Hospital and dispensary instruction in the surgical treatment of cancer.

Apply to Superintendent
301 E. Nineteenth Street, NEW YORK CITY

THE NEW YORK POLYCLINIC MEDICAL SCHOOL AND HOSPITAL

(ORGANIZED 1881)

(The Pioneer Post-Graduate Medical Institution in America)

WE ANNOUNCE

FOR THE GENERAL SURGEON

A COMBINED SURGICAL COURSE

Comprising

GENERAL SURGERY	GYNECOLOGICAL SURGERY	GASTRO-ENTEROLOGY
TRAUMATIC SURGERY	UROLOGICAL SURGERY	LABORATORY
ABDOMINAL SURGERY	PROCTOLOGY	X-RAY DIAGNOSIS
NEURO-SURGERY	ORTHOPEDIC SURGERY	

CADAVER COURSES in all branches of surgery

SHORT TIME PERSONAL AND SPECIAL COURSES in all medical and surgical specialties

FOR INFORMATION ADDRESS

EXECUTIVE OFFICER: 345 West 50th Street, NEW YORK CITY

University of Pennsylvania

Graduate School of Medicine

The Medico-Chirurgical College

Courses for Physicians

Regular Graduate Medical Courses of One to Three Years' Duration, Leading to Appropriate Certificates or Graduate Medical Degrees in the following separately organized and conducted Clinical and Medical Science Departments:

Internal Medicine, Pediatrics, Neuropsychiatry, Dermatology-Syphilology, *Radiology, Surgery, Gynecology-Obstetrics, Orthopedics, Urology, Ophthalmology, Otolaryngology, *Biochemistry, *Anatomy, *Physiology, *Pathology, *Bacteriology-Immunology, *Pharmacology.

In every course the registration quota is limited. All of the stated Regular Courses begin annually in mid-October except in the cases of departments designated by the asterisks, wherein the courses begin whenever vacancy occurs in the quota. A "year" is thirty-two or more weeks, according to the department concerned.

Certain briefer **Special Courses** (special subdepartmental subjects) are also available, as follows: Tuberculosis, Clinical and Sociologic; Cardiology, Gastroenterology; Protein Sensitization, Parasitology and Tropical Medicine; Diabetes, Mellitus, Arterial Hypertension and Obesity; Electrotherapeutics; Infant Feeding; Intubation; Clinical Psychiatry; Clinical Dermatology; Neuroanatomy and Neuropathology; Neurootology; Operative Surgery and Surgical Anatomy; Anesthesia; Orthopedic Diagnosis; Operative Orthopedics; Ophthalmic Operations; Ocular Perimetry; Ocular Musculature; Ocular Refraction; Laryngoscopy, Bronchoscopy and Esophagoscopy; Otologic (cadaver) Operations; Otolaryngologic (cadaver) Operations; Clinical Biochemistry; Basal Metabolism.

Address: Dean, Graduate School of Medicine, University of Pennsylvania, Philadelphia

UNIVERSITY OF MARYLAND, SCHOOL OF MEDICINE AND COLLEGE OF PHYSICIANS AND SURGEONS

Requirements for Admission—Two years of college work, including English, Chemistry, Biology and Physics, in addition to an approved four years high school course.

Facilities for Teaching—Abundant laboratory space for equipment. Two large general hospitals absolutely controlled by the faculty and several hospitals devoted to specialties, in which clinical teaching is done.

The last regular session opened September 28, 1925.

For catalogue apply to J. M. H. Rowland, M.D., Dean, N. E. Cor. Lombard and Greene Sts. Baltimore, Md.

BACILLUS BULGARICUS

We have in our files a selected list of over seven thousand of the better physicians of this country who have used for years and still are using to their satisfaction

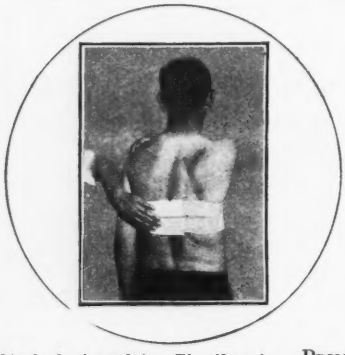
BULGARA TABLETS, H. W. & D.

for treating the conditions for which we recommend them. These tablets contain only the most viable and active strain of the **BACILLUS BULGARICUS** in suspended animation and have demonstrated their therapeutic value during the sixteen years we have been supplying them for the use of the medical profession.

Information on Request

H. W. & D.—SPECIFY—H. W. & D.

HYNSON, WESTCOTT & DUNNING
BALTIMORE



Method of applying Elastikon in thoracoplasty and wherever it is desired to restrain excursion of the affected thorax. See right hand column for complete directions.

..... Sample Coupon .....

Johnson & Johnson,
New Brunswick, N. J.

Please send me Elastikon sample and literature.

M.D.

Street

City State

Druggist's Name

"That awful pain in my chest is relieved, Doctor. Now I can breathe comfortably"

This is the invariable comment of patients when Elastikon (elastic adhesive plaster) is applied to limit chest motion in the following disorders:

PRINCIPAL USES OF ELASTIKON IN THORACIC CASES

Tuberculosis (surgical and medical). Pleurisy. Fractured ribs.

Dr. Howard Lilienthal has stated* that in these conditions, elastic adhesive plaster (Elastikon) is superior to other mechanical methods for restraining respiratory motion. Its extraordinary value must be observed clinically to be fully appreciated. Sample available.

**American Journal of Surgery*, 39:227

Johnson & Johnson
NEW BRUNSWICK, N.J., U.S.A.

How to Use Elastikon Correctly

Elastikon is supplied in 1 yard lengths, 2 inches and 3 inches wide. As it is capable of being stretched to almost double its original length, the degree of restraint to the respiratory movements is most effective.

In fact, in these cases, Dr. Lilienthal has found it best not to stretch elastic adhesive plaster to its fullest limit.

Two strips are usually applied (2" for children, 3" for adults), strapping the lower part of the thorax, and not overlapping. These should extend from midline in front to midline in the back. In cases where both sides are affected, only the "worse side" should be strapped.

Each strap should be applied either in a horizontal plane, or preferably higher in front and lower in the back.

It is extremely important that each end of each strip be held down at once with a generous piece of ordinary Z-O Adhesive Plaster of the same width to prevent curling up.

As the same pieces are left in place indefinitely, Elastikon is economical in addition to being remarkably effective.

SOUTHERN MEDICAL JOURNAL
JOURNAL OF THE SOUTHERN MEDICAL ASSOCIATION
PUBLISHED MONTHLY BY THE SOUTHERN MEDICAL ASSOCIATION AT BIRMINGHAM, ALA.

Volume XIX JULY 1926 Number 7

MEDICINE

INTERNAL DISEASES, PEDIATRICS, NEUROLOGY, DIAGNOSTIC METHODS, ETC.

FURTHER STUDIES ON PYELITIS*†

By HENRY F. HELMHOLZ, M.D.,
Rochester, Minn.

The following report of recent studies on pyelitis can best be presented under three headings: (1) the essential pathologic lesions of pyelitis; (2) the mode of infection in pyelitis; and (3) the treatment of pyelitis.

PATHOLOGIC ANATOMY

Studies were made on fourteen necropsy specimens, seven of which were sent me by pediatricians and seven of which were my own. The pathologic anatomy is of great interest, first, because it enables the various manifestations to be correlated into a definite clinical picture that we call pyelitis, with its underlying morphologic changes; and second, because it may help in ascertaining the mode of infection. Experiments on animals indicate that ascending and hematogenous pyelitis can be distinguished histologically. In ascending pyelitis the changes are essentially in the extrarenal wall of the pelvis, while in hematogenous pyelitis the characteristic changes are in the papilla. It is beyond the scope of this paper to go into any detail concerning the pathologic lesions, but it is of interest to outline a few outstanding features.

Three of the fourteen specimens showed no change in the sections of the kidney and pelvis examined. This is not infrequent when pyelitis or better, pyuria, is the accessory but not the primary cause of death. The other eleven specimens showed such marked changes in the kidney and pelvis that a conclusion regarding the mode of infection, whether ascending or hematogenous, was impossible.

Recently a specimen of a kidney was sent to me from an infant five months old whose entire illness had lasted only eleven days. The clinical course was of pyelitis, and pyelonephritis terminating in septicemia, which proved to be due to the colon bacillus. Large abscesses were everywhere in the kidney, filling in the space from the cortico-medullary juncture to the pelvis and causing compression of the cortex. This is probably as early a specimen as can be obtained and it can be said from the clinical course of the illness and from the anatomic findings that probably this was an ascending infection from the pelvis to the kidney, but the mode of infection of the pelvis cannot be determined (Fig. 1).

A kidney specimen, recently sent me, from an infant eighteen days old, was of interest because of a possible double infection. It had been necessary to catheterize the infant during the first four days of life. On the sixth day a fever of 102° appeared. Several days later one ear drum ruptured. On the tenth day the urine was loaded with pus and colon bacilli. Death occurred fourteen days after the onset of the illness. The pathologic findings were extremely interesting. Throughout the renal cortex and medulla were multiple healing abscesses, which appeared in the gross (Figs. 2 and 3) like masses of pus but on histologic examination proved to be masses of phagocytic cells and young connective tissue cells. Evidently here the kidney was able almost completely to overcome the hematogenous infection from the ear that produced abscesses in the renal parenchyma, but the infection by the colon bacillus persisted in the renal pelvis, as is evidenced by the polymorphonuclear infiltration of the pelvic lining and the papilla of the kidney (Fig. 4).

A third case, seen during the last year, was one of congenital stricture of the ureter. Although the infection of the kidney and pelvis ended fatally after one month, the lesions were practically entirely healed and no evidence of acute reaction was to be found in the tissues. It must be noted, however, that the infection undoubtedly became generalized and that the child died from septicemia rather than from the pyelitis. The infecting organism here, too, was the colon bacillus (Fig. 5).

*From the Mayo Clinic, Section on Pediatrics.

†Read in Section on Pediatrics, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., Nov. 9-12.

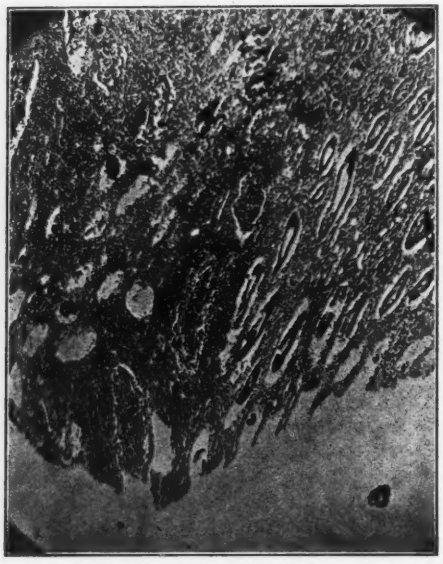


Fig. 1. Tip of a papilla; tubules and interstitial tissue filled with pus.

A study of the lesions produced experimentally in the rabbit has helped considerably in the interpretation of those found in the kidney of human beings. Perhaps the most striking similarity is seen in the healing of the cortical lesions. In gross sections the lesions in rabbits, just as in man, look like abscesses filled with purulent material, but at the end of two weeks a complete replacement of the polymorphonuclear exudate by a network of connective tissue cells is found, so that when phagocytosis is complete, the lesion looks very much like an actively growing fibromyoma. The lesions of the pelvis in the second case were practically identical with acute lesions produced by hematogenous infection in rabbits.

As a result of the examination of pathologic specimens from the human and of the experimental lesions produced in rabbits, it can be said that the healing processes in the kidney and pelvis are extremely rapid. In a maximal period of three weeks, even with obstruction, the evidence of an acute infection can be completely removed from kidney and pelvis. If fourteen days is the total length of the illness in the second case, it probably took at least three or four days for the abscess to develop to its height. Consequently the repair is the work of ten days or less. These sections demonstrate very clearly the wonderful power of repair residing in the kidney. It is to be hoped that in the future pathologic material may be obtained showing only involvement of the renal pelvis.

It is of the greatest importance that careful histologic study be made of pathologic findings in the urinary tract in cases in which death has been due to causes other than pyelitis in order that a possible differential histologic picture be outlined. I am greatly indebted to several members of this Association for specimens, and feel that only by bringing all of the material together can we hope to obtain some light on this problem.

THE MODE OF INFECTION

It is well known that there are three possible modes of infection of the urinary tract. Very little evidence has been brought forward in the last few years to prove that any one of the three modes is the likely one. Those that have believed in the hematogenous mode of infection have placed a great deal of weight on the excretion through the kidney of organisms circulating in the blood stream. The experiments of Biedl and Kraus have been referred to in that they showed that bacteria consistently appeared in the urine within a period varying from a few minutes to an hour after their intravenous injection. In a large series of experiments it has been shown that under normal conditions colon bacilli, streptococci, or staphylococci never ap-

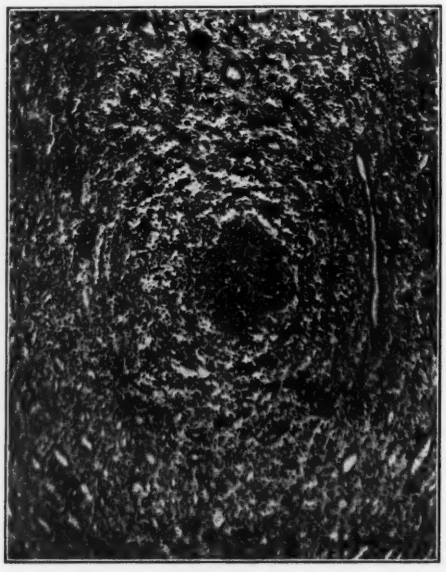


Fig. 2. Low magnification of healed abscess in cortex.

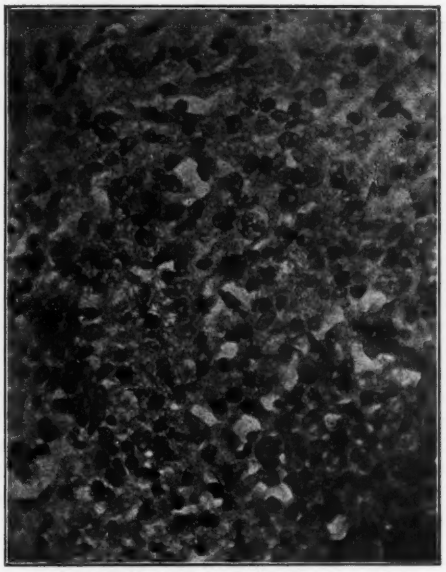


Fig. 3. Young connective tissue and phagocytic cells; high power.

pear in the urine of rabbits in four hours or less as shown originally by Wyssokowitsch in 1886. Furthermore, we have shown that injury to the kidney produced by a variety of nephrotoxins,[3] by tying the renal artery and vein for varying intervals up to ten minutes,[2] and by tying the ureter for periods up to one hour did not hasten the passage of the organism from the blood into the urine.[4]

The relationship of other infections of the kidney to the entrance of the colon bacillus into the urinary tract was studied. By the injection of staphylococci into the blood stream, an infection of the kidney was produced and pyuria established. Colon bacilli were then injected intravenously. It was naturally supposed that the colon bacilli would rapidly enter the urine, gradually replacing the staphylococci, but in a series of sixteen experiments,[5] covering a period varying from a few hours to ten days, the colon bacillus was isolated from the urine in only two instances. In experiments in which the two organisms were injected simultaneously, colon bacilli appeared in the urine from twenty-four to forty-eight hours after staphylococci.

The hydronephrosis experiments were of interest in that the rapidity with which organisms appeared in the urine was practically no greater than under normal conditions. When avirulent organisms were injected, the urine was sterile on culture even after an interval of twenty-four hours, in some experiments.

These experiments cannot decide the mode of infection in pyelitis but they do shake the foundation on which the theory of the hematogenous mode of infection has been built. The assumption that the presence of bacteria in the blood stream is sufficient evidence to warrant their appearing in the urine is no longer justifiable. In this connection the report of Levy is of significance. He found that in forty cases of colon bacillus bacteremia following abortion, the culture of the urine was negative in twenty-six. That focal staphylococcic lesions in the kidney do not necessarily predispose to the renal localization of the colon bacillus circulating in the bloom stream is shown very definitely by experiments on the rabbit.[5]

TREATMENT

The value of different modes of treatment in cases of acute pyelitis has always been very difficult to determine: first, because of the difficulty in knowing whether the infection is of the kidney, the pelvis, or the bladder; second, because pyelitis is a self-limited disease of a great range of severity; and third, because anatomic anomalies seriously interfere with the cure of an infection. It would, therefore, be

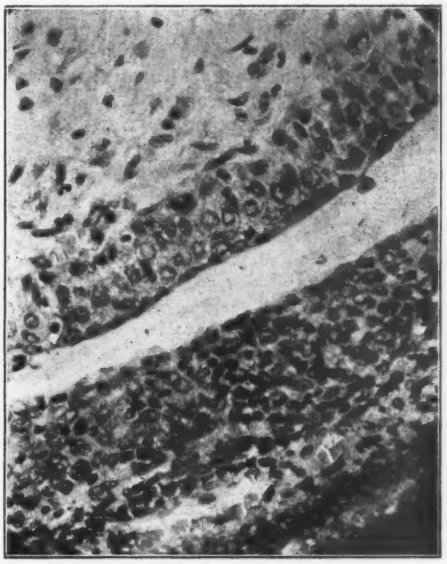


Fig. 4. Acute pyelitis; pus in pelvis and interstitial tissue.

Fig. 5. Complete absence of acute inflammatory reaction.

almost impossible to judge the relative merits of different drugs by treating a series of cases with each drug. Even the more chronic infections may clear up spontaneously after intensive antiseptic treatment has failed (Table 1). The difficulty of making a comparison of different drugs in the treatment of cases of pyelitis is very evident when this case is studied. Conclusions drawn from the result of any treatment instituted at this time would have been erroneous.

It seemed rather important, therefore, to get conditions as nearly uniform as possible and try out the different drugs in animals infected with the same organisms in exactly the same manner and kept under identical conditions. Hematogenous injections with colon bacilli and staphylococci were used to produce the infections.

Technic.—All animals were catheterized before injection and the urine cultured and examined microscopically. Sixteen animals were injected in each experimental series: there were four controls, and three groups of four each treated with hexylresorcinol, hexamethylenamin, and mercurochrome. The drugs were administered by mouth or stomach-tube once, and exceptionally twice, daily. An interval of from two to four days was allowed to elapse after injection to make sure that the infection was definitely established, before the drugs were administered. Then at intervals the animals were catheterized and the urine examined for pus, the number of organisms to each cubic centimeter being counted on litmus lactose agar plates. After two successive negative cultures had been obtained the use of the drug was discontinued and cultures repeated to determine continued sterility.

Of the series of sixteen animals inoculated intravenously with the colon bacillus, only the group treated with hexamethylenamin showed sterile urine. None of the animals treated with hexylresorcinol or mercurochrome showed sterile urine. Three of the four rabbits treated with hexamethylenamin had sterile urine after fifteen days. The urine of the control rabbits was sterile after thirty-one days.

The results in the series inoculated intrave-

TABLE 1

Failure of Hexamethylenamin and Hexylresorcinol

Case	Age, Years	Sex	Date	Hexamethylenamin gm., 4 times daily	Hexylresorcinol gm., 4 times daily	Degree of pus in urine	Organisms in 0.5 c.c. urine (colonies)	Remarks
1*	5	F	2-27-25	0.5		2	Innumerable	1 gm. ammonium chlorid
			3-17-25	0.5		2	1000	1 gm. ammonium chlorid
			3-18-25		0.15	1	Innumerable	Frequency of micturition
			3-23-25		0.15	1	Innumerable	
			3-30-25		0.3	1	Innumerable	Abdominal pain
			4- 7-25			1	Innumerable	
			4-13-25					Cystoscopic examination
			4-14-25	0.5		1	Innumerable	1 gm. ammonium chlorid
			4-20-25	0.5		0	Innumerable	
			4-25-25			0	Innumerable	
			5-13-25			0	0	

Duration of symptoms, 1 year.
Infecting organism, colon bacillus.

TABLE 2

Cases of Chronic Pyelitis Cured with Hexamethylenamin

Case	Sex	Age, Years	Infecting Organism	Duration of Symptoms, Years	Hexamethylenamin* gm., 4 times daily	Length of Treatment (days)	Remarks
1	M	11	Colon bacillus	6	1.5	42	
2	F	11	Colon bacillus	4	1.0	8	Sodium acid phosphate 1.34 grains 4 times daily
3	M	12	Staphylococcus	0.16	0.65	7	Sodium acid phosphate 1.34 grains 4 times daily
4	F	9	Colon bacillus	4	1.0	3	
5	F	14	Colon bacillus	3	1.0	4	
6	M	12	Staphylococcus	0.75	1.5	4	
7	F	3	Colon bacillus	2.5	0.75	11	
8	F	3	Staphylococcus	2	0.5	6	1 ounce residual urine; cord bladder (?)
9	F	4	Colon bacillus	2	0.75	5	
10	F	9	Colon bacillus	4	1.0	5	
11	F	14	Colon bacillus	5	1.33	14	
12	F	8	Colon bacillus	3	0.66	6	

*Maximal dosage.

nously with staphylococcus were even more striking. On the ninth day all four rabbits given hexamethylenamin had sterile urine. There was not a single instance of sterile urine in the groups treated with mercurochrome or hexylresorcinol. Under the particular circumstances of these carefully controlled experiments therapeutic results were obtained with hexamethylenamin and not with hexylresorcinol or mercurochrome.

TABLE 3

Successful Treatment with Hexamethylenamin

Case	Sex	Age, Years	Date	Hexamethylenamin gm., 4 times daily	Hexylresorcinol gm., 4 times daily	Degree of Pus in Urine	Organisms in 0.5 c.c. Urine (colonies)	Remarks
1	M	12	11- 3-22	1.5		4	Innumerable	Staphylococcus infecting organism
			11- 4-22	1.5		4	1110	
			11- 6-22			4	0	
			11-10-22			3	0	
			11-15-22			1	0	
			5-20-25		0.15	2	Innumerable	Staphylococcus infecting organism
			6-22-25		0.15	2	Innumerable	15 grains ammonium chlorid, 4 times daily
			6-23-25	0.5				
			6-25-25			2	0	Hematuria
			6-27-25				60	
			6-28-25	0.5		1		
			6-30-25	0.5		1	0	Hematuria
			7- 2-25				0	
			7- 6-25				0	
			7- 8-25			0	0	
2	F	7	4-27-25		0.15	3	Innumerable	Colon bacillus infecting organism
			4-30-25		0.15		Innumerable	
			5- 7-25		0.15		Innumerable	
			5- 8-25	0.5				1 gm. ammonium chlorid
			5-15-25	0.5			0	
			5-18-25	0.5			0	
			5-25-25				0	

With chronic infection of the urinary tract it is relatively easier to determine the effect of various therapeutic measures. There are two groups of chronic cases, those with and those without urinary stasis. In the last five years I have observed a considerable number of cases of both groups. In a selected group of twelve cases, without anatomic obstruction, the condition in all but two had persisted for more than two years, and in some patients as long as five or six years (Table 2). Of the twelve cases three were in boys and nine were in girls. Two boys and one girl had a staphylococcal infection; in the remainder colon bacillus was the infecting organism. The three staphylococcal infections were of the shortest duration, one of two months, one of nine months, and the third somewhat questionable, but probably of about two years. Of the other cases two had persisted for two years, two for three years, three for four years, and one each for five and six years. The maximal dosage of hexamethylenamin varied from 0.66 gram for the younger children to 1.5 grams four times daily for those more than nine years of age. The most striking feature of the series was the short interval between the institution of treatment and the appearance of sterile urine. No urine was considered free from infectious organisms until two successive cultures were negative, the first of these never being taken less than forty-eight hours after the cessation of medication. During the last year practically all the patients have received 1 gram of ammonium chlorid four times a day with the hexamethylenamin, tablets being made up of 0.5 gram of hexamethylenamin and 1.0 gram of ammonium chlorid. This assures a hydrogen-ion concentration between 5 and 5.5, and the mixture is usually well tolerated by the stomach.

In a number of the chronic cases of pyelitis,

TABLE 4

Comparative Value of Hexylresorcinol and Hexamethylenamin*

Case	Sex	Age, years	Date	Hexylresorcinol daily	Hexamethylenamin gm., 4 times daily	Degree of Pus in Urine	Organisms in 0.5 c.c. Urine (colonies)	Remarks
1	F	14	8-12-24	4 doses of 0.33 gm. each		2	Innumerable	Bladder irrigated with 1 per cent mercurochrome once daily
			8-14-24			4	Innumerable	
			8-18-24			1	Innumerable	
			8-19-24	4 doses of 0.66 gm. each				
			8-22-24			4	Innumerable	
			8-25-24			1	Innumerable	
			8-28-24	4 doses of 1.0 gm. each		1	Innumerable	
			8-30-24			1	Innumerable	
			8-31-24	Discontinued				
			9- 1-24		1.0			
			9- 3-24			1	38	
			9- 5-24			1	1	
			9- 9-24			1	10	
			9-11-24		1.33			
			9-15-24			0	0	
			9-16-24		Discontinued			
			9-19-24			0	0	
			9-24-24			0	0	
			9-30-24			0	0	
2	F	8	7-6 -24	3 doses of 0.66 gm. each		0	Innumerable	
			7- 8-24			0	Innumerable	
			7-10-24			1	Innumerable	
			7-11-24	4 doses of 0.66 gm. each				
			7-14-24			1	Innumerable	
			7-15-24	Discontinued	0.66			Ammonium chlorid started, 2 gm. twice daily
			7-17-24			1	0	
			7-19-24			1	0	
			7-21-24		Discontinued			
			7-24-24			1	0	
			7-26-24			0	0	
			7-28-24			0	0	

*Infecting organism, colon bacillus

hexylresorcinol was first given and hexamethylenamin later. In view of the recent reports[6] that it usually takes about two months to cure a colon bacillus infection with hexylresorcinol, it was not used long enough in our cases. In view of the rapid clearing up with hexamethylenamin, however, it hardly seems warranted to have persisted longer with hexylresorcinol.

ANALYSIS OF CASES

In Case 1 (Table 3) the patient had been given hexylresorcinol treatment for one month, 0.15 gram three times a day. At the end of that period the infection with staphylococcus was just as marked. After ten days' treatment with hexamethylenamin the urine was sterile and remained so. Three years before, a similar infection had been cured in three days by means of hexamethylenamin. In Case 2 (Table 3) hexylresorcinol was given for ten days with no effect, but the urine remained sterile after seven days' treatment with hexamethylenamin.

In Cases 1 and 2 (Table 4) the infection due to the colon bacillus was cured rapidly by treatment with hexamethylenamin after failure of liberal doses of hexylresorcinol. Two cases in which infection was complicated by anatomic anomalies (Table 5) show the failure of both these urinary antiseptics. In the first the right ureter was markedly dilated; in the second there was an atonic condition of the entire urinary tract; so that these cases possibly do not belong in the class of cases without stasis in the urinary tract.

The outstanding feature in the twelve cases (Table 2) treated with hexamethylenamin is the rapidity with which the infection cleared up. Leaving out of account the one case with residual urine which took six weeks to clear up, the infections disappeared in two weeks or less, eight in one week or less. It would seem, therefore, of importance to give hexamethylenamin in large doses over a period usually not exceeding two weeks. If no cure is effected in this time, the likelihood of successful treatment with hexamethylenamin is relatively slight, judging by our successes and failures. Inasmuch as I have been recently quoted as advocating large

TABLE 5

Failure of Treatment with Hexamethylenamin and Hexylresorcinol (attributed to the presence of anatomic anomalies)

Case	Sex	Age, years	Date	Hexylresorcinol, 4 times daily	Hexamethylenamin 4 times daily	Degree of pus in Urine	Organisms in 0.5 c.c. Urine (colonies)	Remarks
1*	F	9	8-18-25**				Innumerable	25 c.c. residual urine double ureter right
			8-19-25		0.5 gm.		Innumerable	Ureteral orifice and ureter dilated 2
			8-30-25		1.0 gm.		Innumerable	1 gm. ammonium chlorid
			9- 5-25		1.0 gm.		Innumerable	
			9-24-25	0.15 gm.			Innumerable	Bladder irrigated
			9-27-25	0.3 gm.			Innumerable	
			10- 1-25	0.45 gm.			Innumerable	
			10- 3-25	0.6 gm.			Innumerable	
			10- 9-25		1.0 gm.		Innumerable	
2†	F	10	6-14-24			4	Innumerable	Congenital atony of entire urinary tract
			6-19-24	0.33 gm.				
			6-24-24			3	Innumerable	
			6-28-24	0.66 gm. (3 times)				
			7- 2-24			4	Innumerable	
			7- 7-24			3	Innumerable	
			7-10-24	0.66 gm.		1	Innumerable	
			7-14-24			1	Innumerable	
			7-15-24	Discontinued				
			7-16-24		0.66 gm.	1	Innumerable	
			7-19-24			1	Innumerable	
			7-21-24		0.1 gm.			
			7-22-24			1	Innumerable	
			7-26-24			1	Innumerable	

*Infecting organism, colon bacillus.
**Duration of symptoms, seven years.
†Infecting organism, Bacillus proteus Asiaticus.

doses of hexamethylenamin in cases of acute pyelitis, I wish to emphasize again that all of my recent work in the use of large doses of hexamethylenamin has been done in cases of chronic pyelitis.

In regard to treatment with antiseptics, it is well known, but apparently frequently disregarded, that one antiseptic in the attainable concentration cannot always be expected to influence infection with bacteria of different kinds or even with different strains of the same micro-organism. Furthermore, there is much evidence that the test-tube experiment, even under the most rigid conditions, need not indicate the value of a given antiseptic when administered to an animal. With intravenous administration of antiseptics, the possibility of aggravating the infection may have to be considered.

SUMMARY

Histologically the experimental lesions of pyelitis in rabbits approximate those found in infants. Healing of acute suppurative lesions of the kidney is extremely rapid and complete.

Experiments on the appearance of bacteria in the urine after intravenous injection do not bear out the contention of those who maintain that they appear in a few minutes. They were never found in four hours or less. Acute staphylococcic lesions of the kidney do not favor localization of colon bacilli injected intravenously.

In cases of acute pyelitis of rabbits hexamethylenamin was found more effective in treatment than hexylresorcinol or mercurochrome. In cases of chronic infection of the urinary tract in children, hexylresorcinol, used in the dosage and for the period indicated, had practically no effect. Hexamethylenamin proved successful in most uncomplicated cases in two weeks or less.

BIBLIOGRAPHY

1. Biedl, Arthur, and Kraus, Rudolf. Ueber die Ausscheidung der Mikroorganismen durch die Niere. Arch. f. exper. Path u. Pharmakol., 37, p. 1, 1896.
2. Helmholz, H. F., and Field, Ruth S.: The Kidney: a Filter for Bacteria. IV. The Effect of Clamping the Renal Artery or Renal Vein on the Passage of Bacteria into the Urine. Am. Jour. Dis. Child., 29, p. 645, 1925.
3. Helmholz, H. F., and Field, Ruth S.: The Kidney: a Filter for Bacteria. V. The Effect of Nephrotoxins on the Kidney Filter for Bacteria. Am. Jour. Dis. Child., 30, p. 33, 1925.
4. Helmholz, H. F., and Field, Ruth S.: The Kidney: a Filter for Bacteria. VI. The Effect of Ureteral Obstruction on the Excretion of Bacteria. Am. Jour. Dis. Child. (In press.)
5. Helmholz, H. F., and Bowers, Marion R.: The Kidney: a Filter for Bacteria. VII. The Passage of Bacillus coli through the Kidney with Acute Staphylococcic Lesions. Am. Jour. Dis. Child. (In press).
6. Henline, R. B.: Hexylresorcinol in the Treatment of 50 Cases of Infections of the Urinary Tract. Jour. Urol., 14, p. 119, 1925.
7. Levy, Alfred: Kritische Studie uber die Infektionswege bei Pyelitis acuta auf Grund klinischer Beobachtungen. Deutsch. Arch. f. Med. 138, p. 1, 1921.
8. Wyssokowitsch, W.: Ueber die Schicksale der in's Blut injicirten Mikroorganismen im Korper der Warmbluter. Ztschr. f. Hyg., 1, p. 3, 1886.

THE DIAGNOSIS OF CARCINOMA OF THE ESOPHAGUS AND A SHORT DISCUSSION OF ITS TREATMENT*†

By E. B. FREEMAN, M.D.,
and
By H. E. WRIGHT, M.D.,
Baltimore, Md.

We desire to take up the methods used in diagnosis of carcinoma of the esophagus somewhat in detail, with special reference to the clinical history, x-ray studies, and esophagoscopy, by which methods an accurate diagnosis may be made in most cases. With reference to treatment, we desire merely to touch upon the palliative measures now employed, and to express the hope that in the near future surgery will be able to devise some operative procedure which will give to this group of cases a chance of recovery.

Because the greater portion of the esophagus lies deeply within the thoracic cavity, the usual methods of physical examination give us no information of practical value. It is necessary therefore to take advantage of every method of examination that will in any way throw light upon esophageal conditions. Our routine in these cases is to take a careful clinical history, make a complete physical examination, an x-ray examination (fluoroscopic and film study) of the esophagus and gastro-intestinal tract, an esophagoscopic examination, and to pass guided bougies. All these methods are necessary if one is to arrive at a correct diagnosis.

We agree with Jackson that the early symptoms of carcinoma of the esophagus, in many cases, are not brought out by the usual history taken. Even in some well advanced cases, very definite symptoms referable to the esophagus are overlooked entirely. A complete physical examination does not throw any light upon the esophageal condition, but does help materially in ruling out pathology in other of the thoracic and abdominal viscera, which may produce esophageal symptoms. A careful x-ray study is

*From the Johns Hopkins Gastro-Intestinal Clinic.

†Read in Section on Gastro-Enterology, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

very valuable in confirming the clinical diagnosis. Esophagoscopy is most essential in all cases, but especially in the group where a correct diagnosis cannot be made from the clinical history and x-ray study. The passage of guided bougies gives valuable information of the extent to which the esophagus is involved.

AGE AND SEX INSTANCE

Age.—Age always has an important bearing in the diagnosis of carcinoma in any location. We do not expect to find a malignant stricture of the esophagus in persons under thirty-five years of age, although we know that it is not impossible. Conversely, we do not expect to find a spasmodic lesion in patients over forty-five years of age presenting symptoms of esophageal obstruction. In our experience an esophagospasm at forty-five years or over has been rare, although we know of at least one authentic case.

Sex.—Sex seems to have a definite relation to carcinoma of the esophagus. Conservatively speaking, we should say that at least 80 per cent of the malignancies occur in males.

LOCATION OF TYPE OF GROWTH

There is a wide difference of opinion in the literature as to the location of the growth. However, observers have found that the lesion occurs most frequently in the lower third of the esophagus. They all agree that the lesion occurs in the portions of the esophagus subject to increased irritation, these being at the points of anatomical narrowing.

In a recent article, Jackson reports 671 cases in which a specimen was taken and reported malignant. The types of growth were as follows:

Squamous-celled and atypical epithelioma	337
Basal-celled	2
Adenocarcinoma	316
Lymphosarcoma	2
Round-celled sarcoma	2
Fibrocarcinoma (epithelioma developing on scar?)	1
Squamous-celled, plus gumma	1
Squamous-celled, plus tuberculosis	1
Mixed, type uncertain	2
Ulceration but probably malignant	7

"The squamous-celled type was found at all levels, but chiefly in the upper two-thirds."

In the group of cases that we have studied esophagoscopically, many times specimens were not taken for microscopic study; but we are convinced that adenocarcinoma of the esophagus is practically limited to the lower third, whereas the squamous cell type may be found anywhere, but especially in the middle and upper third.

SYMPTOMATOLOGY

The early symptoms of carcinoma or other organic diseases of the esophagus may be very vague and indefinite. Their vagueness has caused the patient many times to ignore them, and the physician, if consulted at all, to treat them as functional; but, if an early diagnosis is to be made, it will be made by studying carefully this group of cases.

All sorts of indefinite symptoms occur in the early cases. We have heard complaints of "a lump in the throat," "tightness in the chest," "discomfort beneath the sternum," "food sticking beneath the sternum which afterwards passes down," and "difficulty in starting to swallow."

History of difficulty in swallowing, or even consciousness of the act, so vague as to be interpreted as "sticking sensation in the chest," "lump in throat," or "pain in the back or under the sternum while swallowing," are sufficient grounds to justify further esophageal investigation.

While we are fully aware of the fact that many cases will be examined unnecessarily, we also know that in a small group, at least, malignant disease will be found; and if malignancy of the esophagus is to be cured by operative treatment or otherwise, the diagnosis must be made early.

There are many cases, however, in which we have been unable by clinical history to bring out any of the above symptoms. The presenting symptom in this group is dysphagia, and the patients state that they first noticed difficulty in swallowing solid food. This difficulty has gradually increased until, when they seek medical advice, they may be able to swallow only liquids with great difficulty. Even in this group the patient does not attach much importance to the difficulty in swallowing until it has become marked enough to cause definite nutritional disturbances. Frequently they consult their physician for weakness and loss of weight, and may not call attention even at this time, to the difficulty in swallowing. Later on, there may be added to these symptoms cough, pain, marked emaciation, cachexia, and sometimes hematemesis.

These symptoms for the most part are occasioned by the lodgment of a solid bolus of food in a thick indurated and ulcerated stricture of the esophageal wall encroaching upon the normal lumen.

We believe the growth must have been present and the patient must have had vague and indefinite symptoms for at least three to six months before these definite symptoms appeared.

X-RAY

In the diagnostic study of a patient presenting esophageal symptoms, the x-ray examination should follow the clinical history and physical examination. In the vast majority of cases, the clinical history leads one to believe that he is dealing with an obstructive lesion in the esophagus, the nature of which must be determined by careful x-ray studies and other special methods of examination. It is of utmost importance in these cases to determine whether or not the symptoms are produced by extrinsic or intrinsic causes. The most frequent extrinsic causes are aneurysm of the thoracic arch, enlarged mediastinal glands from any cause, malignant tumors of the mediastinum, and enlargement of the heart. X-ray studies are most valuable in excluding such conditions as the cause of the obstructive symptoms, and they must be excluded before further diagnostic measures can be safely employed. If obstructive symptoms are associated with aneurysm of the thoracic arch, one would hesitate before making an esophagoscopic examination under these conditions, as this method of study would be a very dangerous procedure, even in the hands of an expert. The same would be true if x-ray study revealed a large tumor mass filling the mediastinal space; also one would hesitate in making an esophagoscopic examination if the heart was markedly enlarged. After the extrinsic causes of obstructive symptoms have been excluded, then a careful x-ray study should be made of the esophagus and stomach. By careful x-ray study of the esophagus, one is able to determine quite accurately the location of the lesion which is responsible for the symptoms; also one is able to determine the motility of the esophagus or the rapidity with which the contents pass on into the stomach.

In x-ray we have a very accurate and convenient aid. Plate examination, using a thick barium mixture, is usually accurate in not only localizing the lesion but also in determining their nature. An irregular filling defect surmounted by a rather moderate dilatation, in proportion to the degree of obstruction, is usually sufficient evidence upon which to base a diagnosis of malignancy of the esophagus. There are, however, a few instances of peri-esophageal carcinoma occurring low down in the esophagus near the cardiac opening causing moderately marked dilatations above in which we do not believe this is true. The lower end of the barium column may even be regular in outline and taper off to a well formed symmetrical point so closely resembling the appearance noted in cardiospasm that it is next to impossible to make an accurate differentiation. We have seen not infrequently a peri-esophageal carcinoma diagnosed as spasmodic disease.

In conjunction with a careful x-ray study of the esophagus, it is also necessary to make a thorough x-ray study of the stomach. Not infrequently carcinoma of the cardiac end of the stomach so impinges upon the lower end of the esophagus as to produce obstructive symptoms.

It is in these more or less complicated cases that endoscopy is of indispensable aid. It has been stated that a careful fluoroscopic examination aided by diagnostic plates in the hands of a competent roentgenologist should seldom fail to reveal the true nature of the lesion. In our experience this has been true in a degree, but not infrequently we have found that the x-ray examination, even when interpreted by a competent roentgenologist, confuses malignant stricture at the cardia with cardiospasm. Malignancy at higher levels is seldom, if ever, incorrectly diagnosed roentgenologically.

ESOPHAGOSCOPY

By esophagoscopy one can directly inspect the esophagus, carefully look for, and usually locate, any pathological condition that may be present. There is nothing so convincing in the study of disease as direct inspection. If one actually sees the lesion, he can arrive at a more definite decision than if he is obliged to make the diagnosis by indirect methods. Marked advancement in the diagnosis and treatment of many visceral diseases has followed when direct inspection of the diseased area has been made possible by instruments of precision. May we not expect as much if a routine esophagoscopic study was made in every case presenting symptoms referable to the esophagus? This procedure has not been carried out as a routine. The medical profession as a whole has looked upon esophagoscopy as a very formidable and dangerous procedure. As a matter of fact, the examination is neither dangerous, difficult nor painful if done by one who is thoroughly trained. In the hands of an improperly trained person, of course, the procedure is very dangerous, and as yet comparatively few physicians have seen fit to take the necessary training to overcome

the few technical difficulties encountered in making the examination. It is to be hoped that more of the profession will become interested in the method that esophagoscopy will be recognized as one of the most important methods of examining the esophagus, and will be done early in all cases that present esophageal symptoms. By this method, one can find a carcinomatous lesion at an earlier stage than by x-ray.

The examination does not require the patient to remain in the hospital. It may be made in the out-patient department, or in one's office. No general anesthetic is needed, in many cases not even a local, though in a few cases the examination can be made with less difficulty if a local anesthetic is used. To make the examination quickly and without discomfort to the patient, it is necessary to have a thoroughly trained assistant, who works with you continuously, to hold the patient's head and change its position when necessary during the examination. Teamwork in esophagoscopy is just as important as in any other procedure.

We thoroughly appreciate the fact that by making an esophagoscopic examination of every patient presenting esophageal symptoms many cases will be esophagoscoped unnecessarily; but we also know that a small number of early carcinomas will be diagnosed, and if carcinoma of the esophagus is to be cured surgically or otherwise, the diagnosis must be made early in the disease. The squamous cell type of carcinoma does not metastasize early, grows very slowly, and should offer a good chance of recovery, if the technical difficulties of its surgical removal can be overcome.

By direct inspection through the esophagoscope, one is able not only to make a diagnosis in many cases but to obtain valuable information of the extent of the disease. In doubtful cases, a specimen can be removed for microscopic study. This should be done in all early cases, and probably in the late cases, too. Surely in all cases in which operative treatment is considered, one should have absolute proof that the lesion is cancer before trying to convince a comparatively well person that he should submit to such a serious surgical procedure as resection of the esophagus. Positive evidence of the nature of the lesion must come from a pathological study of the tissue removed.

BOUGIES

The indiscriminate passage of esophageal bougies has done much to delay the early diagnosis of carcinoma of the esophagus. It is the general impression among the profession that, if a bougie passes without difficulty, no organic disease exists in the esophagus. This is absolutely untrue since a very early lesion does not cause obstruction, and a late sloughing adenocarcinoma may permit a bougie to pass freely. We are opposed to the blind passage of bougies under all circumstances, even though no organic disease be suspected. The procedure is dangerous, and quite a few perforations of the esophagus have occurred, followed by fatal results. On the other hand, by using olive-tipped bougies guided by a silk thread which has been anchored in the small intestines, much valuable information may be gained with perfect safety. The ease or difficulty which one experiences in passing guided bougies gives very definite information as to the degree of narrowing of the esophageal lumen, the firmness of the obstructive lesion, the extent of involvement of the esophageal wall, and the type of carcinomatous disease present. No other method of examination gives so much information as to the degree to which the esophageal lumen has been narrowed.

It is an easy matter by this method to determine the degree of stenosis at one sitting without danger to the patient. When this has been determined, it is much easier to decide what course to pursue in regard to treatment. Also the firmness of the obstructive lesion can best be determined by this method. Surely one would not think of gastrostomy in a case of this sort, if the stenosed area can be dilated easily.

While the x-ray examination gives very valuable information as to the location of the growth, it does not give us a definite idea as to the extent of the esophageal involvement; neither can the extent of involvement be made out by esophagoscopy. The x-ray filling defect in some cases is out of all proportion to the actual lesion present. We have seen a small annular carcinoma of the esophagus in the middle third give a filling defect that would indicate very extensive involvement of the esophagus, extending well into the lower third. Very often endoscopically one sees only the upper edge of the malignant growth and can make out nothing about the esophagus below this level. In periesophageal carcinomas involving the lower end of the esophagus, nothing is made out esophagoscopically, but an absence of mucosal folds in the involved area, a redness of the mucous membrane, and a stiffness or firmness of the esophageal walls. Therefore, we believe that

bougies carefully used are valuable aids in making a diagnosis of carcinoma at any level, and are especially helpful in peri-esophageal carcinoma involving the lower end of the esophagus, where many times a diagnosis of malignant disease cannot be made either by x-ray or esophagoscopic examination.

PROGNOSIS

Until someone devises a better way of treating carcinoma of the esophagus than we now have, the outlook is hopeless. In our present knowledge of malignant disease, we must look to surgery to bring forth some operative procedure that will offer at least a small percentage of cures. It would seem that any risk is not too great for the patient in this group of cases. The patient has nothing to lose, and possibly something to gain by operative treatment. It seems possible to cure some of the cases with carcinoma at the lower end of the esophagus by operation. Very much valuable work, experimental and otherwise, has been done along this line by Willy Meyer, H. Lilienthal, Henry H. Janeway, Robert T. Miller, Heuer, Carl A. Hedblom, and others. We sincerely hope, and believe, that in the near future someone will be able to overcome the operative difficulties which now prevent the successful performance of the same. If one is to expect good results from surgery, however, an early diagnosis of the lesion must be made. At present nearly all cases are far advanced before surgical intervention is sought. This is due in most part to the fact that the medical profession as a whole does not fully appreciate the importance of the careful study of all patients presenting esophageal symptoms. Squamous cell esophageal carcinoma does not metastasize early, grows very slowly, is not of a high degree of malignancy, and should offer relatively good results if the patient is able to survive the shock of operation. The adenocarcinomata always occur at the lower end of the esophagus, and, if diagnosed early, should not present insurmountable surgical difficulties. One of the greatest difficulties in the successful handling of this group of cases is the delay in diagnosis and the late period when surgical help is sought.

While it is highly desirable that the public in general have an accurate knowledge of the early symptoms of carcinoma of the esophagus, it is equally unwise to attach publicity to a condition in which we must confess a 100 per cent mortality. An educational campaign for malignancy in other regions is not faced by this hopeless mortality.

This mortality may be overcome if the profession fully realizes that symptoms referable to the esophagus are usually due to organic disease, not to functional disturbances.

TREATMENT

We shall discuss the treatment under two chief headings: (a) Palliative and (b) surgical.

Palliative Treatment.—A palliative surgical procedure can be instituted in the form of a gastrostomy for feeding purposes, but such an operation is in many respects inferior to dilatation of the malignant stricture. There can be but one reason for doing a gastrostomy as a palliative measure, that is, to make the patient more comfortable. If only palliative measures are to be adopted, why subject the sufferer to a gastrostomy existence? To pour one's food into the stomach through a funnel and tube and endure the discomforts of an acid, irritating overflow for the balance of one's existence is uncomfortable, not to mention the discomforts occasioned by the operation itself.

In spite of the fact that, in the minds of many, dilatation of a malignant stricture is a decidedly unsurgical procedure, we are of the opinion that it accomplishes as much as gastrostomy with less attendant suffering. We are also persuaded that dilatation properly conducted is not the dangerous procedure that some would have us believe. Our method, like that used at the Mayo Clinic, consists in the passing of olive-tipped bougies over a thread which has been swallowed the previous night and has become anchored in the small intestine. Graduated sizes are used and the strictures dilated as much as possible at one sitting. Usually we are able to dilate sufficiently to admit the passage of a No. 45 French size. The discomfort experienced is negligible and the danger of rupture not great. In a paper published recently from the Mayo Clinic, 1,000 cases of esophageal carcinoma are analyzed, of which 500 were dilated by the above method with three ruptures in the series. A similar number were not treated by means of dilatation and three ruptures occurred spontaneously. In our experience only one case has died from fatal hemorrhage following dilatation. As to the difficulties in feeding, anything which can be poured through a gastrostomy tube can be swallowed through a properly dilated malignant stricture. We are taking our stand for dilatation as a palliative measure, with the conviction that, if properly performed, it accom-

plishes as much for the patient, as palliative gastrostomy without the attendant suffering and indignity of the latter.

Surgical Treatment.—Surgical treatment, instead of being palliative, should aim at a cure of a certain percentage of carcinomas of the esophagus. This is true of carcinoma in other localities and should be true of carcinoma of the esophagus, especially when the lower third only is involved. A few excellent authorities are of the opinion that carcinomas occurring in the lower third of the esophagus are so malignant that an attempt at surgical cure is virtually hopeless. We do not concur in this extremely pessimistic view but are convinced that a certain number are of the squamous cell type which give symptoms early and metastasize late. The majority, perhaps, are of the adenotype and are consequently exceedingly malignant, but with early diagnosis even some of these might be cured. For a number of years past there have been a few enthusiastic and conscientious surgeons who have striven faithfully to solve the problem of the esophageal inaccessibility. Of late a renewed interest has aroused in a few who have been in close contact with the Johns Hopkins Gastro-Intestinal Clinic. The problem is to interest more surgeons in this otherwise hopeless condition. Even in the beginning, when the technic is young, the mortality as a result of operation should not be greater than the mortality rate prevalent when brain surgery was first attempted.

We realize that an absolute, early diagnosis is necessary to persuade any surgeon to take the risk, and are ready to do the utmost in our power to accomplish this end. The problem of the early diagnosis of esophageal carcinoma is one which touches the whole profession, the responsibility being incumbent upon the practitioner and specialist as well as on the surgeon himself. It does not matter what type of operation is developed. Whether it aims at removal of the growth and immediate reestablishment of the swallowing tract, or whether it is a two-stage operation, the prime object of which is the removal of the growth with a view of reestablishing the deglutory function later, matters not a whit. Our plea is for an early diagnosis and an operative technic applicable to carcinomas of the esophagus, especially those located within that portion commonly called the "lower third."

DISCUSSION (Abstract)

Dr. J. Russell Verbrycke, Jr., Washington, D. C.—It is fortunate for those of us who have never learned esophagoscopy that the x-ray diagnosis of esophageal conditions is more reliable than is x-ray diagnosis in any other part of the gastro-intestinal tract. I wish that I could use the esophagoscope, although it is likely that I should employ it in very few cases.

My experience differs from that of Dr. Freeman in that I have seen quite a few cardiospasms which began after forty years of age. One thing has been surprising, that is, that in a series of over 250 cardiospasm cases I have seen carcinoma of the esophagus develop but twice. In cases coming in with carcinoma of the esophagus I have not in a single instance obtained a history of a preceding cardiospasm.

At the present time, and with the present status of surgery of the esophagus, I do not feel that early diagnosis is very important. Some time I hope the opposite will be true. If I had a very early esophageal carcinoma, I would not be operated upon during that stage. I should prefer to have several months of comparative health, with perhaps an operation to end it after life became intolerable.

For palliative treatment I still lean toward gastrostomy, with radium and deep x-ray (although they do not do much good), affording rest for the part. Neither dilatation nor gastrostomy is pleasant, but I believe the latter prolongs life more.

MODERN ASPECTS OF SYPHILIS

By C. Brooks Willmott, M.D.,
Louisville, Ky.

The advent of the first quarter of the Twentieth Century has brought about more advance in the knowledge and scientific treatment of this disease than the preceding four hundred years of study, which began shortly after the raid of Charles VIII upon Italy, when syphilis really first attracted attention.

The one greatest achievement, perhaps, was the discovery and demonstration of the Treponema pallidum in a condyloma in 1905 by Schaudinn and Hoffman,[1] whose publication of this first report led to much work and study from numerous sources in verifying their findings. To Naguchi and Moore must go the sole credit of first demonstrating Treponema in paretic brains in 1913, which verified the belief that paresis was practically always of syphilitic origin.

Metchnikoff and Roux had a few years previously first transmitted the disease to the lower animals. Apes and later rabbits were found very good subjects for inoculation in the study of the organism. Previous to this, man solely had the distinction of harboring this dreaded disease.

*Read in Section on Dermatology and Syphilology, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

Methods of infection, aside from sexual intercourse, and especially of transmission, began to be more carefully studied, which brought about numerous reports of extragenital chancres frequently acquired from the common use of public drinking cups, linens and tableware.

Regarding transmission to offspring, the father who had previously borne all the blame became almost completely exonerated when Wassermann, Neisser and Bruck contributed their complement-fixation test, which proved beyond any doubt that women bearing syphilitic children are themselves directly responsible for its transmission, since the great majority of them have this disease in a latent form and show positive Wassermanns.

Consequently, teaching in medical schools all over the world had to be revised, Colle's and Profeta's laws thrown into the discard and new ones devised.

Means of diagnosis were further aided with the development of another laboratory aid, the dark field illuminator with staining methods for demonstrating Treponema in secretions, their actual presence in tissue, and lastly the living organism from initial lesions, absolutely the most valuable aid we possess at the present time, not even excepting the Wassermann. Unfortunately, too often, through the ignorance of both patient and physician, this method is rendered useless by the early application of antiseptics and caustics.

Evolution had its part in our present methods of diagnosis and treatment of this much dreaded disease. Proof of its etiology in the actual demonstration of the causative agent, Treponema pallidum, necessarily came first before serological and other laboratory tests could follow. All led up to the scientific treatment, to the final discovery of some drug or drugs which would at once clear the circulatory system. The drug was to bear the brunt of the earlier stages of the invading organisms by actual contact, or cause some change in the blood itself by toning up the wavering leucocytes and rallying them to battle and victory.

This longed-for therapy came only after hundreds of experiments, and then was almost accidently discovered. The investigator, I am informed, was searching for a cure for sleeping sickness. However, Ehrlich's contribution of arsphenamin revolutionized the treatment of syphilis, and has done, and will do, more good in the final control, and I hope eventually in the stamping out of this dreaded disease.

My vision of the promising future is stimulated by the establishment of the prenatal clinics in our leading cities for the treatment of the pregnant luetic mother who, if early diagnosed, can be delivered of an apparently clinically and serologically healthy baby by the proper administration of arsphenamin and mercury. Intensive or at least all the weekly doses of arsphenamin which can be administered without untoward effects, perhaps as many as two full courses with a course of mercury intervening, should be given, if time permits, before delivery.

We have reason to believe that almost any disease is more readily cured by early than late diagnosis, and early institution of therapy directed toward that disease.

Syphilis has long been held by medical men to be responsible for the great majority of miscarriages, and the light of modern investigation has brought about proof of this opinion. Active treatment, early instituted in pregnancy not only markedly affects the mother's health but actually prevents miscarriages, and most often results in the birth, "as far as we know," of a healthy child which, without this indirect treatment, may have miscarried, been born with active lesions, or developed them shortly following birth. This early therapy, though not always entirely successful, actually accomplishes more toward preventing blindness in the newborn than any other means.

Interstitial keratitis, which usually appears in children from five to sixteen years of age, often responds most remarkably to early administration of arsphenamin, and, in my experience, the older the child the more treatment is necessary, some cases requiring twelve to fifteen doses before improvement is apparent, and continuance up to twenty or twenty-five doses. Here iodids seem to favor clearing up of corneal opacities with final administration of mercury to reach the organisms which have gotten out of the circulatory system and lie hidden in various tissues of the body.

Present-day opinions seem to indicate the administration of the iodids, principally in late stages of infection or the so-called tertiary stage, with the exception previously mentioned of eye involvements. Much has been written of the Wassermann test and its value in both diagnosis and as an index to further treatment. Suffice it to say that its greatest value is in the diagnosis of obscure cases of both the acquired and congenital types.

Regarded as an index to further treatment, it seems logical to conclude that its greatest value depends upon its early negative phase after a full course of treatment in a given case of secondary infections in which both clinical symptoms and serological findings were frankly positive.

In my limited experience, checking over the records of some four or five thousand cases in the Out-Patient Department of Skin and Syphilis at the Louisville City Hospital, I find that those cases which show after a full course of treatment a negative Wassermann, which remains so with continued treatment for from one and one-half to three years, are the most promising for clinical cure. On the other hand, those cases who take only one course, and neglect to return for further treatment, either with or without a negative Wassermann thirty days after the last dose of mercury, are the ones which show recurrent secondaries, tertiary lesions, nerve involvements, Wassermann-fast conditions, etc.

To be brief, when we can show control of the Wassermann, a negative reaction within six months after frank secondary symptoms with a positive Wassermann, then, as a rule, we have well founded hope of its remaining so, but only by continued treatment for two or three years, with the usual monthly rest between courses.

Opinions of the leading syphilologists of this country regarding the so-called Wassermann-fast condition are uniform in that involvement of the nervous system has taken place early, usually during the secondary stage when the circulatory system was heavily laden with treponema which consequently could more readily invade the brain and spinal cord with these organisms.

Intraspinous therapy has, in my experience, accomplished much in some cases and seemingly utterly failed in others. Frequent tapping with drainage while the blood and lymph are heavily impregnated with arsphenamin from its recent intravenous injection accomplishes much.

Aside from any and all treatment, the personal equation, one's natural resistance to any infection, be it tuberculosis or any disease, plays a leading role in the cure of syphilis. No doubt many perfectly healthy individuals have been infected with this disease, and by natural resistance, with clean living, both as regards exercise, rest and proper diet, have entirely thrown off the infection, while others of poor health and physical make-up seem to succumb in spite of any and all treatment just as they often do in pneumonia, typhoid fever and various other systemic diseases.

No case of luetic infection should be treated for more than six months without a complete analysis of the spinal fluid, whether the blood reaction be either negative or positive. If it is found negative, this test should be repeated at least every three to six months until time for temporary dismissal arrives. Even then, the patient should be instructed to return at least yearly for observation throughout life.

PROGNOSIS

Now comes the rub. What can we promise our patients? We shall touch only lightly on the dishonest or wholly ignorant physician who promises his patient a cure often by arsphenamin alone, because he can get much more out of the case. I have had many cases who had been unfortunate victims and were compelled to sacrifice their business for the fees of from $25 to $50 for their weekly dose of arsphenamin, the only limit in number of doses being the financial limit of the patient. Almost invariably these poor unfortunates finally apply to a charity clinic for recurrences either in the late secondary, tertiary or neural stage.

Except with the occasional patient, mostly actors and traveling salesmen, often referred by physicians from other cities, I never make a specific charge for arsphenamin. I have a minimum fee for a complete course of treatment, usually extending over a period of about six months. This is of advantage both to physician and patient. As a rule, I believe in intensive treatment, especially before the blood stream infection, or if the condition is diagnosed in the early secondary stage, but in those cases only which show no untoward results. Often I first, or occasionally after the course of arsphenamin if the patient has not held his own or perhaps gained flesh and does not feel generally improved, administer intravenously some preparation of iron, combined with other tonics.

During the period of intramuscular injection of mercury, if nodules persist I feel that there is little or no absorption taking place and institute intravenous mercury or one of the best preparations of bismuth.

I know from personal experience that much of the gray oil administered during the World War existed apparently unchanged in nodules for years, as I have since cut down on and drained these nodules in cases to whom I had administered the drug while in France. These encapsulations may exist for years and appar-

ently become secondarily infected through trauma or pressure, break down and discharge through a sinus, finally healing by scar formation, leaving little pits in the skin. This result might be explained by the short needle used, the injection having been made into adipose tissue and not into the muscle, but I think that gray oil is equally to blame.

The most we can hope for in the average case is a cure, and it would seem that the best we usually get, possibly excepting cases in the primary stage, is healing of the lesions, and control of symptoms: one might say a clinical cure.

Beyond this we are sure of nothing, and our prognosis, our answer to the query of the patient, can you cure me, should be encouraging rather than discouraging. We should explain to him in simple words the absolute necessity of his cooperation in every way and the unforeseen happenings about the final outcome of which no one can safely render an exact verdict.

Physical make-up, natural resistance, means of living, and faith in the physician all tend to render the prognosis more favorable.

The general practitioner, and often the cardiovascular specialist, have a tendency to discourage the use of arsphenamin in cases showing involvement of the vascular system, liver, spleen and kidneys. My personal belief is that those cases only which show active lesions or clinical symptoms should be treated with arsphenamin. Mercury, and possibly the iodids or bismuth, should be the drug par excellence in those cases where the damage has been done with the result of formation of scar tissue, which, of course, cannot be regenerated. Our purpose in this is to reach, if possible, the organisms in the various tissues of the body which are inactive, or later may become so.

Carefully guarded half doses of arsphenamin in aortitis and its commonest complications, aortic insufficiency, angina pectoris and aneurysm, are advocated by some of our greatest syphilologists, who find that much good results in the relief of pain, and quite often other distressing symptoms disappear. One's choice of a drug in these cases should be governed largely by tolerance of the patient for that particular drug or marked improvement in health with a corresponding disappearance of symptoms.

Too vigorous treatments being perhaps more detrimental to the patient than inadequate treatment, often a change from arsphenamin to mercury, or even vice versa, is productive of good results and allaying of symptoms or their complete disappearance.

Shortly following the appearance of the complement-fixation test of the blood came the Wassermann on the spinal fluid, and our knowledge was added to, because many cases which had shown persistent negative blood reactions were found to be positive when 1 c.c. of spinal fluid was used.

In paresis the vast majority of cases show a positive reaction in both blood and spinal fluid, while in cerebrospinal syphilis the reaction is often negative in the blood and positive in the spinal fluid, if amounts of 1 c.c. or more of the serum are used in the test. This is a point in diagnosis in differentiating these two conditions.

While involvement of the nervous system probably occurs early in the disease, the spinal fluid often shows a positive Wassermann early and frequently is the only way a diagnosis could be made, as clinical symptoms may be delayed for many years.

A negative Wassermann of the spinal fluid is likewise helpful in differentiating multiple sclerosis, cerebral and spinal tumors from syphilis.

Pleocytosis, or an increase of lymphocytes, is found in about 95 per cent of syphilitic involvements of this system, but one should remember that old cases of tabes often show no lymphocytosis and that one-third of all syphilitics may at some stage show an increased lymphocytosis without manifesting any clinical symptoms of organic disease.

Additional and fairly recent tests, as the protein content of the spinal fluid, and the colloidal gold curve of Lange are of great value both in diagnosis and as a point in control of this disease when it involves the cerebrospinal system. Especially the so-called paretic curve is most helpful, and when the other four laboratory reactions of the spinal fluid are positive, if small amounts 0.05 to 0.2 c.c. are used, then the diagnosis of paresis is practically certain. When backed up by the four cardinal physical signs, speech defects, the Argyll-Robertson pupil, abnormal knee reflex, and Romberg's sign, the diagnosis is completely established.

Whether to persist in treatment of Wassermann-fast cases after three years has proven to me quite a puzzle. If they present no clinical symptoms and feel well, I often discontinue all forms of drugs and have them report every six months for observation.

Numerous cases over fifty years of age are sent to our clinic with positive Wassermanns, no clinical evidence of lues except possibly glandular enlargement, some ill-defined subjective symptoms, and a history of initial lesions years ago. I feel that arsphenamin here is not indicated, and put such cases on potassium iodid, followed by mercury.

Infants born of recently infected luetic mothers should receive anti-luetic treatment, especially mercury by inunction. Should the mother give a history of an old infection, present no evidence of lues either symptomatically or serologically, treatment should be deferred till symptoms appear. Conditions of general nutrition should be carefully looked into and proper diet prescribed along with general hygienic measures.

The question of the infallibility of the Wassermann reaction must necessarily come up if one sees many and all kinds of cases in a large clinic. In one case of secondaries a four-plus may become negative after a course of treatment, while in another similar case the reaction remains four-plus in spite of one or many courses of treatment, and often the four-plus patient feels well and presents no clinical symptoms while the negative case complains of vague symptoms. One naturally wonders whether involvement of the nervous system has taken place, but when complete analysis of the spinal fluid is made with an absolutely negative result how can we explain the blood reaction?

Often surgical operations are performed, and on failure of the wound to heal promptly a Wassermann is made and the blame laid to a positive Wassermann. These cases may present absolutely no clinical symptoms and give a reliable negative history. All of these conditions at times make one doubt the absolute infallibility of the test. Certain prominent authorities feel that a one- or two-plus reaction means syphilis without a specific history. Others only consider a three- or four-plus as proof positive with a specific history. Perhaps we are too prone to accept a positive finding without any actual clinical symptoms. Possibly we are getting stale in our diagnostic ability.

However, clinical symptoms have changed markedly since arsphenamin was introduced. Often secondaries are delayed or aborted, and certainly tertiary lesions are becoming less frequent. We do not see the gumma and other late lesions so frequently, yet there has been a large increase in involvements of the nervous system as shown by the reports of the best authorities of the present age. Finally, let us hope that we are becoming more skilled in our early diagnosis and treatment.

We are seeing more cases, because we are ever on the lookout for them. Certainly we are markedly shortening the infection period in secondary syphilis, and, finally, I feel that we are looking forward to a perfection of the Wassermann test, which at present is confusing, and laboratory workers are daily toiling to bring this about.

BIBLIOGRAPHY

1. Zinsser: Jour. Lab. and Clin. Med., 1, No. 1, 1916.
2. Finger and Landsteimer: Centralbl. f. Bakteriol., Ref. 38, 1906.
3. Wassermann, Neisser and Bruck: Deutsch. Med. Wchnschr., 32, p. 745, 1906.

DISCUSSION (Abstract)

Dr. Emmett R. Hall, Memphis, Tenn.—Some one made the remark that he had long since lost his taste for the Wassermann. There is still a great deal of misunderstanding and confusion among the members of the medical profession regarding the exact value and limitations of the Wassermann. Nevertheless it is the most valuable single laboratory test that we have today. It is one procedure that has stood the test of time in the hands of the experienced and the bungling of the inexperienced. Probably the physician meant that he had lost his taste for the Wassermann in the hands of the inexperienced technician, not in the hands of a well trained technician.

When arsphenamin was first used, the immediate results were so gratifying that we thought that most cases could be cured with a few doses. We know better now, and sometimes become discouraged because it seems almost impossible to cure them at all.

The treatment of syphilis is comparable to the treatment of cancer in some respects. The public is being educated to the necessity of early treatment and today we are not seeing in charity clinics or in private practice the tertiary syphilis which we saw a few years ago.

Last year I reported before this Section the results of anti-syphilitic treatment in the syphilitic expectant mother. The results were very gratifying where the patient started treatment early in pregnancy.

Educate the public and you can almost make congenital syphilis a thing of the past.

Dr. Rex Bolend, Oklahoma City, Okla.—I should like to add a word to the already clouded field of the management and treatment of cases of luetic aneurysm and aortitis in which it occurs to me that we follow more or less blindly some oft-repeated statements.

The histo-pathology of all luetic lesions is alike, except for the structures involved and the extent of the lesion. The hyperplasia and necrosis, when there is no secondary infection, is at the expense of the new tissue, plasma cells and connective tissue, and even while a lesion is present the connective tissue cells in it do not constitute a scar. On treatment they are absorbed, leaving only the normal tissue.

This is fundamental in the development and absorption of luetic lesions. With these facts in mind, why

should we fear to use neo-arsphenamin in this type of cases? Of course, I do not suggest a radically intensive treatment. It is good judgment to study well and not overtreat any luetic, whether there be aortitis or plain secondaries.

In our clinic we have had at least a hundred cases of aortitis and aneurysm due to lues. They have all been put on a mild routine anti-luetic treatment and in no case have we noted any ill effects.

Dr. Sidney J. Wilson, Fort Worth, Tex.—I trust that the view of those who do not believe syphilis curable will not reach the public ear. Whether it is curable or not, we know that under proper conditions it can be controlled. The view of the average layman is easily changed, and I think it best that the laity should believe it a disease that is curable, because in order to obtain any results you must have the complete cooperation of the patient.

It is a lamentable fact that only a very small per cent of syphilitics receive enough treatment. My records disclose only eighteen cases who have had two and a half years' treatment. I am sure others completed their treatment elsewhere, but only eighteen were under my direct supervision, extending over a period of sixteen years. Of these cases three were re-infected, having the typical primary lesion. This, to my mind, is fairly conclusive evidence that at least a good percentage of syphilitics are curable.

Dr. F. J. Eichenlaub, Washington, D. C.—Dr. Willmott's remarks on the prenatal treatment of syphilis deserve special stressing. This is the time for prevention or cure of congenital syphilis. It should be impressed on the minds of all physicians that the development of congenital syphilis in an infant whose mother was under observation any time before the sixth month of pregnancy is directly due to the physician's negligence in the vast majority of cases. Wassermann tests should always be made at the time a pregnant woman first comes under observation.

In the treatment of all types of congenital syphilis and late or latent syphilis, the warning of Dr. Udo Wile against the immediate use of arsphenamin will bear repetition. These cases should all be started on mercury.

Dr. Willmott stresses the use of spinal puncture in Wassermann-fast cases. This procedure should be used in every case irrespective of the Wassermann reaction. On the other hand, the impression should not be given that all Wassermann-fast cases are due to neurosyphilis.

Dr. Wilmott (closing).—I thank Dr. Eichenlaub for calling my attention to the fact that Treponema pallidum was first demonstrated in a condyloma instead of a chancre as stated in my paper.

I agree with the Doctor that the uncertainty of the curability of lues should not be too strongly impressed on the patient. Yet we are often asked: "Can you cure me, Doctor?" We must, to be honest, tell just what we can promise. Often, especially in early cases, we can offer much encouragement and promise a clinical cure at least. In late chronic cases I believe it a mistake to promise too much.

The Wassermann test is still the most valuable single laboratory test, yet I do not make a positive diagnosis of syphilis with a weak positive unless I find clinical symptoms and perhaps a history of primary lesion.

If treatment is early instituted, many cases are cured, and certainly we are not seeing late lesions as in years past.

Anti-syphilitic treatment in our prenatal clinics is most gratifying and promises much toward the stamping out of congenital syphilis.

Properly related cases of aoritis and many other cases of cardiac complications as well as early liver involvement warrant the use of arsphenamin. Early jaundice is more often due to influx of Treponema than to the drug which usually gets the blame.

642 Francis Building

FOUR CASES OF OLIVO-PONTO-CEREBELLAR ATROPHY GIVING A HISTORY OF HEREDITY WITH THREE AUTOPSIES*

By Wm. Keiller, M.D., F.R.C.S. (Ed.), Galveston, Tex.

The writer owes to Dr. Joe Jones, of Galveston, Texas, the opportunity of reporting the neuro-pathological findings in two brothers and a nephew by a sister's side, suffering from nearly identical symptoms, together with a clinical report of the still living sister of the third case.

The brothers are Wm. A., who died September 7, 1923, aged 32, and John A., who died July 14, 1924, aged 35, colored men, laborers by occupation. The third case is Joe E., nephew to the brothers by a sister's side, who died February 14, 1924, aged 37. Wm. A. and John A. and Joe E., each suffered markedly for about nine years from the symptoms which ended in death, and the first two were in the County Poor Farm about five years.

Family History.—The patients being colored, an accurate family history was difficult to obtain. The mother of John and William had similar symptoms and died at the age of about 45. Her sister is said to have died of a similar condition. No nervous symptoms were traceable on the father's side.

Two brothers, both dead, are subjects of this paper. There were three sisters, all dead, said to have suffered from similar symptoms. Two of these sisters had children. Of these children, one son, Joe E., died at the age of 37, and the pathological findings in his brain and cord are included in this report. One daughter, Henrietta M., aged 33, is now alive and shows prac-

*Read in Section on Neurology and Psychiatry, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

tically identical symptoms with the others. A short history of her case is appended. A younger sister of Henrietta, Mary E., aged 28, is undoubtedly showing early symptoms.

Case 1, John A.—The following history is supplied by Dr. Jones as a personal recollection, especially of the case of John A., with the statement that it will, in a general way, apply to the other cases.

The symptoms began at about 14 or 15 years of age, with lack of coordination in walking, shown by a staggering gait. The patient described his legs as quaking under him, the knees tending to give way. He had no pain anywhere. On admission to the hospital, he gave a history of bilateral, involuntary, choreiform movements, affecting the legs, arms, body and head. While under observation, there was marked bilateral intention tremors so violent that he could not get a glass of water to his mouth, nor could he feed himself without spilling much of his food. Chewing and swallowing were not affected. The shaking movements of the whole body continued when he appeared to be asleep in bed. His head was continuously moving irregularly, with both nodding and rotary movements. His voice was high-pitched, and progressively more difficult to understand, his difficulty in forming words, especially affecting the consonants, linguals, labials and dentals. He died at 35. The urine was negative till near the end and the bowels were regular. Toward the end bed sores formed and he lost bladder control, and showed albumin and hyaline and pale granular casts. There also was some cardiac decompensation.

Dr. Jones reports that Wm. A. suffered very much in the same way as did John, so that the history would apply to both. Toward the end he developed a bronchial affection which may have hastened his death. Joe E. had almost identical symptoms.

In disposition John was rather irritable. The others were very amiable. None showed any mental aberration. In all, the appetite was excessive. Babinski and other reflex tests could not be made.

Henrietta M., nee E.—Joe E.'s sister, niece by a sister's side to John and Wm. A., aged 33, married at 20. Her one child was a boy, now 16 years old, and believed to be in good health. (He lived in another state, so this statement is rather untrustworthy.) She had had one miscarriage. She was well until 1915, when she had a laparotomy at the John Sealy Hospital. The hospital record shows that she had a hysterosalpingo-oophorectomy and appendectomy, for double ovarian cyst and metrorrhagia, uncontrolled by previous curettement. Her present trouble began at the age of 31 (two years previously) with weakness of knees and tendency to wobble in her walk, followed by general shaking of the whole body, especially her arms. She had never had any pain, and her appetite was good.

Physical examination by the writer (December 2, 1924) at the patient's home showed her to be well nourished, with no nystagmus. The home was very small and overcrowded with furniture so that a satisfactory examination was impossible. She was fat, good-natured, intelligent, responsive and able to do a good deal of housework. Her whole body showed trembling movements, rather a coarse general tremor than choreiform. She got about the house fairly well by holding on to many available supports.

Fatigue.—She worked all day long and did not tire easily.

Hypotonia.—Her wrists were flail-like, but the muscles of the arms and legs were firm. Examination for the classical cerebellar syndrome was very inconclusive.

Asthenia.—Her arms were well supported above her head and when held straight out.

Adiadochokinesia.—Making and breaking the fist and pronation and supination showed no adiadochokinesia, and were rapidly performed.

Dysmetria.—She touched her nose well. There was overmeasuring in touching the physician's finger. There was distinct overaction in pronation and supination on both sides, one not more than the other.

Asynergia.—She said she could not bend backward without losing her balance. She could not stand on one foot. There was some unsteadiness when she got up from a seat.

General Coordination.—Her general coordination must have been fairly good, as she washed dishes without breaking them.

Cerebellar Catalepsy.—Her hands and arms straight out or above head seemed to show unusual steadiness, suggesting cerebellar catalepsy.

Fixation nystagmus was not present.

Reflexes.—Her plantar reflex, very poor, seemed slightly extensor. There was no Gordon and no Oppenheim. In speaking, her consonants were not articulated. There were no other apparent defects.

November, 1925, approximately one year after the last examination, Henrietta M. was fat and looked well. Her muscles were firm. All her symptoms had decidedly progressed. Her tremors were more marked. She had considerable difficulty in getting up from a seat, walked with many tremors, shows considerable dysmetria, and tremor in drinking a glass of water, and touched the physician's finger very awkwardly with the palm of her hand. Her speech was markedly slurring. She was cheerful and responsive.

Her sister, Mary, aged 28, who at this same time in the preceding year had just a suspected tremor, had now a decided intention tremor and cerebellar gait.

DIAGNOSIS

In considering the diagnosis of these cases, the two prominent features to be kept in mind are the marked heredity and the coarse involuntary movements.

The hereditary element is undoubted in spite of the difficulty in getting accurate statements, each family history differing a little in this respect from all the others.

The involuntary movements are not the tremors of Parkinsonism, not quite the jerky movements of chorea, but are more like those of multiple sclerosis and cerebellar deficiencies (the tremor in multiple sclerosis being probably a cerebellar tremor).

I suppose we may regard it as fairly well settled that Parkinsonian tremors are pallidal

(paleostriatal) in origin; that true chorea of the Sydenham type points to lack of neostriatal (caudate nucleus and putamen) control; that athetoid movements are probably due to combined thalamo-neostriatal defects, and that there is a group of coarse intention tremors, characteristic of cerebellar deficiencies.

Grouping together the chronically progressive syndromes associated with involuntary movements and without rigidity, we have Friedreich's ataxia, Marie's hereditary cerebellar ataxia; Dejerine and Thomas' olivo-ponto-cerebellar atrophy, which has not hitherto been shown to be hereditary or familial; Gordon Holmes' primary degeneration of the cerebellum, and Huntington's chorea, to which last I give the clinical rather than the pathological name, because its pathology is practically unknown.

If we attempt to arrive at a diagnosis by a process of exclusion, the absence of rigidities, lack of characteristic facies, the choreiform and coarse character of the tremors exclude the pallidal syndromes (Parkinsonism and its allies) as well as Wilson's lenticular degeneration, which is familial but not hereditary.

Friedreich's ataxia is excluded by the absence of sensory defects, the absence of pyramidal symptoms, the lack of the characteristic pes cavus and the age of the patients at death, and perhaps at the period of incidence.

Huntington's chorea, which is suggested by the heredity, is negatived by the absence of mental defect, even in the advanced cases, there being no evidence of mental deterioration in Henrietta and remarkably little in any of the three cases who have died.

We are left with some form of generalized, slowly progressive cerebellar defect. These include generalized cerebellar atrophy (Marie's hereditary cerebellar ataxia), olivo-ponto-cerebellar atrophy (Dejerine-Thomas) and Holmes' familial degeneration of the cerebellum. Of these, Marie's hereditary cerebellar ataxia is rather a clinical than a pathological classification, as it is too indefinite pathologically to be of value; Dejerine-Thomas' olivo-ponto-cerebellar atrophy has not hitherto been shown to be either familial or hereditary, and Holmes' primary cerebellar degeneration is familial but not hereditary.

In looking for the characteristic motor defects which are typical of cerebellar lesions, we must remember that these are largely absent in chronic, slowly progressive cerebellar cases, probably because there is so much opportunity for cerebral compensation.

I think, then, that we are warranted in diagnosing some form of slowly progressive cerebellar defect of a generalized character, the suggestion being Marie's cerebellar ataxia, Dejerine-Thomas' olivo-ponto-cerebellar atrophy, or Holmes' primary cerebellar atrophy. In point of fact, all three cases examined pathologically show the typical lesions of olivo-ponto-cerebellar atrophy.

PATHOLOGY

The pathological findings are practically the same in all three brains. In the upper ends of the cords of W. A. and J. A., there is a strong suggestion of the same cord lesion found in Joe E., but the cord of the last case is the only one available for complete examination.

The lesions are briefly as follows:

Cerebrum.—In each case there is some atrophy of the convolutions, the brain of Joe E. showing this atrophy especially in the frontal and superior temporal lobes.

The basal ganglia in Joe E. and John A. show no lesion to naked eye examination. In Wm. A. the left lenticular nucleus and internal capsule show evidence of acute softening, but this I regard as an intercurrent terminal affection and unconnected with the chronic trouble.

The mesencephalon in all three cases shows absence or extreme paucity of the cells of the substantia nigra and the fine myelinated network which is characteristic of this region.

The cerebellar decussation and red nuclei are apparently normal. The basis pedunculi is small, and, while the pyramidal fibers are well myelinated, the fronto-pontine and temporo-pontine fibers are probably absent, the pyramidal being spread all over the basis pedunculi. This statement is perhaps a little short of proof, as there is not an unstained area corresponding to the medial and lateral fifths of the basis pedunculi but a general diminution of the basilar fibers.

The pons shows in all cases complete absence of pontine nuclei in the basilar portion and an equally complete absence of transverse fibers, the brachium pontis being entirely unstained. There is no excess of neuroglia and no sclerosis. The longitudinal fibers of the basilar portion are probably pyramidal only. This pontine atrophy is marked in all, but much more striking in W. A. than in the others.

In the medulla oblongata there is very marked

atrophy of the inferior olives, olivary cells being completely absent in all parts of the olives and accessory olives. There is a corresponding complete loss of olivo-cerebellar fibers in the hila of the olives and passing through the medial lemnisci.

There is a corresponding loss of fibers in both restiform bodies, these showing a few central fibers only, probably derived from the posterior spinocerebellar tracts, the peripheral (olivo-cerebellar fibers) being absent.

The pyramids are nearly normal in size, perhaps slightly reduced, and quite normal in the way they take the myelin stain. The anterior arcuate nuclei are devoid of cells and anterior superficial arcuate fibers.

With the exception of the nucleus of the third nerves, the motor nuclei of the medulla oblongata, pons and mesencephalon show very few lower motor neuron cells. The lateral sensory nucleus of the fifth and spinal tract of the fifth nerve are apparently normal. The vestibular nerve shows very few stained fibers and the spinal tract of the vestibular nerve is less marked than is normal. Cells of Deiter's nucleus have not been seen. The cochlear nerve stains well.

The cerebellum in each case is very similar to the two others. It is decidedly small (perhaps three-fourths normal size), but regular in outline. The individual folia are regular in distribution but thinner than normal, one-half to two-thirds normal thickness. The brachia pontis (middle cerebellar peduncles) and corpora restiformia are very much attenuated, while the superior cerebellar peduncles (brachia conjunctiva) are nearly of normal size.

Stained sections, microscopically examined, show almost complete absence of Purkinje cells everywhere. Decided diminution of the cells in the granular layer with loss of the usual cell pattern; almost complete loss of myelinated fibers in the white matter of the hemispheres, the myelinated fibers in the vermis being less affected.

On the other hand, the corpora dentata seem normal in thickness and folding; and their cells seem normal in number and staining. The myelinated fibers in the hilum and round the periphery of these nuclei stain well and seem to have suffered little diminution.

So far this description applies to the brains of Wm. A. and John A., and the mesencephalon of Joe E. The brain stem and cerebellum of Joe E. have not been examined microscopically, but the naked eye appearances warrant the presumption of a similar microscopic picture.

Cords.—The upper cervical cord of John A. shows decided sclerosis in the posterior columns, the funiculus gracilis and more superficial fibers of funiculus cuneatus being least affected. There is probably diminution of the fibers in the posterior spino-cerebellar tract. The fibers of the postero-lateral column (of Lissauer) are very scanty. The anterior horn (grey column) cells are greatly diminished, and those present stain poorly (6 to 8 cells instead of 16 to 20 in each horn). The cervical cord of W. A. at the pyramidal decussation shows very few myelinated fibers round the nucleus gracilis, suggesting a posterior sclerosis lower down; the nucleus cuneatus is better supported with fibers, but here also the fibers are diminished.

The pyramidal decussation seems normal. There is scarcity of anterior grey column cells.

It is strongly suggested that the upper cords of Wm. and John A. will support the hypothesis of a similar condition lower down to that about to be described in Joe E.

The most marked characteristics of the cord of Joe E. are: (1) its small size at all levels; and (2) a very decided posterior sclerosis at all levels; but this is of a generalized type and does not show the typical tendency to concentration in the funiculus gracilis in the upper cord.

There is a fairly well-marked lateral sclerosis involving one crossed pyramidal tract; the opposite tract shows some slight pallor in myelin stained specimens.

There appears to be a diminution of fibers in the posterior spino-cerebellar tracts.

The most marked microscopic feature is the great reduction of anterior horn (grey column) cells at all levels.

In a section of the eighth cervical segment, there are 9 to 18 cells where there should be 59 to 60.

There is excess of central neuroglia and in one section (seven thoracic) duplication of the central canal for a short distance.

The nucleus dorsalis (Clark's column) whose cells give rise to the posterior spinocerebellar (direct cerebellar) tract is almost absent.

SUMMARY

Two brothers, a nephew by a sister's side, have suffered for 7 to 12 years from generalized cerebellar symptoms chiefly coarse, intention tremors, staggering gait, dys-synergia and dysmetria, with slurring speech. All three died during the third decade. Two nieces, one 34 and one 28, are alive and suffering from similar

symptoms. The history is strongly suggestive of heredity by the female side.

Autopsies in three of the cases reveal the typical lesions of Dejerine and Thomas' olivo-ponto-cerebellar atrophy. There is no reason to regard the condition as due to syphilis.

The nature of the lesions suggests an abiotrophic atrophy. These cases are the only ones within the writer's knowledge where this particular form of cerebellar defect has shown hereditary characters.

Added to this is a very marked loss everywhere of lower motor neuron cells, a condition not described in Dejerine and Thomas' cases. This loss came as a surprise and is not in accord with the firm muscles of the cases, or with the complete absence of the post-mortem appearance of sections of the thighs and upper arms of Joe E. The limbs themselves were lost sight of before the muscular integrity could be verified by dissection, but there was nothing in the appearance of Joe E.'s body suggesting muscular atrophy.

RECENT PHASES OF THE RICKETS PROBLEM*

By L. Von Meysenbug, A.B., M.D.,
Instructor in Pediatrics, Tulane University,
New Orleans, La.

Even though our current medical literature abounds with writings on various aspects of the rickets problem and many of our medical meetings devote time to symposiums on this subject, I have no hesitancy in bringing before this group a topic that is not only a lively one, but that constitutes one of our most fascinating problems. To solve the pathogenesis and etiology of rickets has racked the brains of generations of investigators and even now our knowledge of this disease is meager indeed.

Ever since Glisson,[1] in 1660, published his report on the symtomatology and incidence of rickets, interest in its etiology has been widespread. This interest, until recently, has been sustained rather than active, as the theories concerning its pathogenesis were as numerous as their authors and bewildering in their confusion. They were almost entirely hypothetical and based for the most part upon general impressions gained by clinicians in their medical practice. Indeed, rickets has been ascribed to nearly every deleterious influence that affects the human race, embracing errors of diet, of hygiene, faulty metabolism, bacterial invasion, dysfunction or inactivity of the endocrin system, etc.

Passing over rapidly the history of two hundred and fifty years in the study of rickets, we find that no significant advances were made until within the past few years, when the discovery of the vitamin added fresh interest to the subject and supplied the impetus for experimental work.

The first serious attempt to reproduce the disease in animals by means of controlled and restricted diets was carried out by Mellanby,[2] who made use of puppies in his work. He centered attention on vitamin A, the so-called fat-soluble vitamin, and endeavored to prove that rickets is a vitamin A deficiency disease. Although Mellanby's results were variable and have not been substantiated by other investigators, they, nevertheless, constitute our first great landmark in the investigation of this disorder from the standpoint of the diet. Without going into the details of Mellanby's work, suffice it to say that by eliminating, as far as possible, vitamin A from the diets of a large series of puppies, he was able to produce rickets in these animals. The British Medical Research Council accepted his conclusions and published them in its report on the Accessory Food Factors. Hence the term antirachitic vitamin so frequently used in British medical literature. More recently, however, Mellanby has modified his view and grants the importance of exercise as an influencing factor.

STUDIES OF THE ROLE OF PHOSPHORUS

At the risk of repeating what is already well known to most of you I shall briefly outline some of the more salient facts with regard to the role of phosphorus in relation to rickets. As is well known, the calcium ion, until recently, had received the greatest attention in the study of the metabolism of rickets, and though the intake, excretion and balance of phosphorus has been considered in many studies, this salt had been relegated to a secondary role. Now, however, our viewpoint has changed, since animal experimentation has brought a realization of the significance of phosphorus. Furthermore, when we consider that bone is largely made up of tricalcium phosphate, we might well wonder why it had not been regarded as of equal importance to calcium in bone nutrition. Following Mellanby's work came the almost simultaneous and quite independent observations of Sherman and

*Read in Section on Pediatrics, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., Nov. 9-12, 1925.

Pappenheimer[3] and of McCollum and his associates[4] which showed that rickets can be produced at will in the white rat by a diet deficient in inorganic phosphorus, and that if this salt be added in sufficient quantity, rickets fails to develop. These studies marked another very significant advance, for they demonstrated the suitability of using a small, easily bred animal for experimental work in rickets, and they placed this disease on a parity with scurvy, which is so readily produced in the guinea pig. Moreover our attention has been drawn, by these observations, away from the calcium ion, which had for such a long time formed the keystone of the rachitic metabolic arch, and focused it upon the phosphorus ion, which in the light of subsequent clinical studies now assumes the dominant role.

Translating these experimental results into clinical language, we are confronted by an apparent discrepancy, that is, that infantile rickets is not simply dependent upon an inadequate supply of inorganic phosphate in the diet. Cow's milk contains approximately five times as much phosphate as woman's milk, and yet we see rickets far more frequently in the bottle fed baby. Moreover, I have shown that the woman's milk upon which the baby develops rickets has the same inorganic phosphate content as that upon which the baby thrives normally.[5]

We have learned from the important work of Howland and Kramer[6] that there regularly occurs in active rickets a reduction in the inorganic phosphate of the blood serum, accompanied by a normal or nearly normal serum calcium. This significant fact would seem to throw the burden of proof upon the absorption of phosphorus from the intestinal tract, since we have granted the adequate intake. In this connection the metabolism studies of Orr, Holt, and others,[7] show that there is little, if any, retention of calcium and phosphorus in the body in rickets, the larger part of the phosphorus and almost all of the calcium being found in the stools. It has also been shown that when high calcium intake is supplied in the diet there is a depression of phosphorus absorption and *vice versa*. Until we know the factors which influence the absorption and retention of phosphorus, it will be impossible to judge the role of phosphorus in various diets of infants. We have in progress now studies on the hydrogen ion concentration of the gastric juice of infants in relation to rickets, for if there exists a medium of insufficient acidity, neither calcium nor phosphorus will be capable of solution and absorption. Thus Zucker[8] in a study of the relation of acid base equilibrium in the body to excretion of phosphorus and calcium found that during a period of hydrochloric acid ingestion more phosphorus and calcium appeared in the urine and less in the feces than during a similar period when fifteen grams daily doses of sodium bicarbonate were ingested. That a hypo-acidity does occur in certain infantile diseases has been clearly proven by the work of Babbot, and others,[9] who found the hydrogen ion concentration markedly lowered in infants with tetany, while Marriott[10] obtained reduced acidity in infants with febrile diseases. It is easily seen, therefore, how repeated infections associated with fever could predispose to the development of rickets, by suppressing gastric acidity and, therefore, lowering calcium and phosphorus retention.

Another very significant fact with regard to phosphorus is the ability of cod liver oil, sunlight and ultra-violet light from artificial sources to cause a negative phosphorus balance to become positive. Just what the mechanism of this beneficial action is we do not know, but the fact must be accepted by the proof[7] demonstrated in the work of Orr, Holt, and others, already referred to.

THE FACTOR OF RADIANT ENERGY

Of equal interest in the study of rickets is the factor of light, or as Park more appropriately terms it, radiant energy.

As far back as 1890, Palm[11] appreciated the value of sunlight in the treatment of rickets and was a staunch exponent of its use for the eradication of the disease. Many years later, in 1912, Raczynski[12] wrote that "it is the sun which plays the principal role in the etiology of rickets," and he supported his claim with studies on the mineral metabolism of puppies as influenced by sunlight.

It remained, however, for Huldschinsky[13] to prove that it is the ultra-violet end of the sun's spectrum which causes lime salts to be deposited in the bones, and this fact has received abundant corroboration. Thus, Hess and Unger[14] made use of the carbon arc light to prevent and cure infantile rickets, and these investigators together with Pappenheimer[15] were successful in preventing rickets in the rat by exposures to the mercury vapor quartz lamp. The cure of infantile rickets by exposure to sunlight was reported by Hess and Gutman,[16] who also showed that the blood phosphate rose as the rickets healed. Thus we see that both in the laboratory and in the clinic the value of radiant energy, directly applied, is fully established. Nor is that all. We

are all perfectly familiar with the seasonal incidence of rickets, which makes its appearance in November and December, increases to reach its peak in March and declines steadily to almost nil in the summer and autumn. In a chart derived from the New York Meteorological Observatory, Hess and Lundagen[17] have pointed out that the sun's spectrum contains, in arbitrary units, zero units ultra-violet rays in November and December, fifty to one hundred units in January and February, and one thousand units in May, June and July, a curve that varies inversely with that of the incidence of rickets.

Very recently we have had proof of the indirect application of radiant energy, that is, that ultraviolet irradiation can impart anti-rachitic properties to inert substances. Hess and Weinstock[18] reported the activation of cottonseed and linseed oils, oils which contain no protective properties against rickets, by irradiation with the mercury vapor quartz lamp. These irradiated oils when fed to rats on a standard rickets producing diet prevented the development of rickets, while rickets developed when non-irradiated oil was fed. The oils were found to have been but little changed; the color was slightly bleached, and peculiarly enough, they frequently acquired a somewhat fishy odor, suggesting that of cod liver oil. Subsequently this work was extended to embrace other inert substances, such as lettuce, growing wheat, cholesterol, phytosterol,[19] flour, all of which were endowed with anti-rachitic properties after irradiation. A solution of chlorophyl is not activated by irradiation, nor are hemoglobin, red blood cells, cream, the phosphatide of egg yolk or glycerin.[20]

Commenting upon the activation of cholesterol and its value in the treatment and prevention of rickets, Hess[18] formulates the following hypothesis: the epidermal portion of the skin contains a large amount of cholesterol in its deeper layers. It would seem quite possible that this cholesterol is normally rendered active by the sun or similar artificial rays bringing about this conversion. This hypothesis presupposes not only the formation of active cholesterol within the skin, but its transport through the body by way of the circulation.

Experiments have been carried out to furnish information in regard to this hypothesis. Young rats were placed on a standard rickets producing diet and divided into two groups: one set was fed a definite supplement (one gram daily) of ordinary skin, the other, skin that had been irradiated with the mercury vapor lamp. Both calf skin and the skin of a cadaver were used. All animals that received the untreated skin developed rickets, whereas all the rats receiving irradiated skin were protected against rickets. The logical deduction from this experiment would seem to substantiate the above hypothesis.

What practical application these experiments may have can only be speculated upon at the present time, and it is of especial interest to note, in this connection, the very recent report of Kramer[21] which shows a curative result in the treatment of infantile rickets by means of feeding with irradiated milk comparable to that obtained with cold liver oil. Kramer's work was well controlled by clinical, serologic and radiographic examinations for rickets.

In the therapeutic application of sunlight or radiant energy there are several factors which affect its potency. There seems little doubt that diet has a reciprocal relation to light, for animals fed a rickets producing diet will either develop rickets or not, according to the dosage of light. Inversely if the dosage of light remains constant, but the rickets-producing intensity of the diet is altered, a similar reciprocal relation can be observed. That infantile rickets is subject to the same cooperative relationship there can be no doubt, for the marked seasonal variation of rickets must be regarded as a failure of the light factor to perform its share of the protective work in winter.

Another influencing factor on the potency of light is rate of growth. Many animal experiments have clearly shown that where the growth is poor, rickets either fails to develop or is manifested mildly. Translated into terms of clinical medicine, this signifies that the marantic infant, notably free from rickets, requires far less of the active light rays than a normally growing infant.

Finally, the intensity of pigmentation of the skin affects the potency of light. If two parallel groups of rats, one composed of white rats, the other of black rats, are given the same diet and a minimal protective dose of light, the black rats will develop rickets, the white ones will remain well. This simple experiment has its clinical analogue in the well-known susceptibility of the negro and dark skinned races to rickets in temperate zones. That this susceptibility is not racial is attested to by their freedom from this disorder in their native homes. It merely indicates that a greater degree of intensity of light is required to penetrate the integumentary pigment.

In the consideration of the pathology of rachitic bones and cartilage there would seem to

be the possibility of an alteration, chemical or structural, in the osteoid tissue and provisional cartilage cells or matrix, such that calcium, even though it may be supplied in sufficient and proper form by the blood, cannot be taken up by these cells. To clear up this point, Shipley and his co-workers[22] have studied the calcification of rachitic bones *in vitro*. Briefly stated, they immersed cartilage of rachitic rats in artificial serum composed of the inorganic constituents of human serum in aqueous solution and found that calcification promptly occurred. Using human serum they found that cartilage calcifies in normal serum, but in rachitic serum no calcification takes place. If in the artificial serum the phosphorus moiety was three milligrams or less per hundred cubic centimeters, calcification is not effected, while in the presence of only five milligrams calcium per hundred cubic centimeters, with phosphorus at seven milligrams, calcification was completed in twenty-four hours. The factor of the hydrogen ion concentration did not appear to be of great importance.

It will be noted that I have said nothing with regard to the use of cod liver oil in rickets, nor is it necessary to dwell at length upon this aspect of the problem. We are all perfectly familiar with its specific curative and preventive action. A word, however, should be said about the variation in potency of different oils and of the recent preparation of a concentrate.

After an experience embracing the use of many oils obtained on the open market, I am convinced that some at least are practically devoid of anti-rachitic activity. In this connection it is of interest to note that cod fish caught during the spawning season, when they do not eat, have livers which are poor in oil and low in vitamin content. The best livers are obtained when the cod fish are feeding upon squid, a small fish that lives entirely upon the plant life growing in abundance in the sea, and before the spawning season. It is not necessary to obtain oil from Norway, as some of our best oil is rendered from cod caught off the shores of Newfoundland.

In an attempt to isolate and identify the chemical entity of the anti-rachitic substances in cod liver oil, Zucker[23] found that it is contained in the ether soluble, unsaponifiable fraction after alkaline hydrolysis. He separated this fraction from that containing the anti-ophthalmic or fat-soluble vitamin A, thus demonstrating that the substance in cod liver oil which cures rickets is not identical with the so-called fat-soluble vitamin. This work led to the preparation of a concentrate by Dubin and Funk,[24] such that 0.5 gram was equivalent, in anti-rachitic potency, to 1,000 grams of the original cod liver oil. Experiments with rats on a standard rickets producing diet showed that this concentrate is just as potent an anti-rachitic agent as the oil from which it was made, gram for gram.

SUMMARY

To summarize briefly the foregoing discussion, as the result of laboratory and clinical investigations our interest now centers around the phosphorus ion in the study of the metabolism of rickets. A low phosphorus diet produces rickets in the rat; a low blood inorganic phosphate accompanies active rickets in the infant. Therapeutic measures raise the blood phosphate. Sunlight and ultra-violet light from artificial sources applied to the rat or infant will cure or prevent rickets. Cod liver oil has a similar curative and preventive action. Inert substances, such as linseed and cottonseed oils, have been rendered active anti-rachitic agents after irradiation with ultra-violet light. The factor in cod liver oil and irradiated oils that is responsible for the cure of rickets is separate and distinct from the fat-soluble A vitamin.

REFERENCES

1. Glisson, F., (et al): De rachitide, etc. Second Edition, London, 1660.
2. Mellanby, E.: An Experimental Investigation in Rickets. Lancet, 1, p. 407, 1919.
3. Sherman, H. C., and Pappenheimer, A. M.: Experimental Rickets in Rats. I. Jour. Exp. Med., 34, p. 189, Aug., 1921.
4. McCollum, E. V., Simmons, W., Shipley, P. G., and Park, A. E.: The Production of Rickets by Diets Low in Phosphorus and Fat-Soluble A. Jour. Bio. Chem., 47, p. 507, Aug., 1921
5. Von Meysenbug, L.: The Inorganic Phosphate Content of Breast Milk of Mothers with Normal and with Rachitic Infants. Amer. Jour. Dis. Child., 24, p. 200, Sept., 1922.
6. Howland, J., and Kramer, B.: Calcium and Phosphorus in Serum in Relation to Rickets. Amer. Jour. Dis. Child., 22, p. 105, Aug., 1921.
7. Orr, W. J., Holt, L. E., Jr., Wilkins, L., and Boone, F. H.: The Calcium and Phosphorus Metabolism in Rickets, etc. Amer. Jour. Dis. Child., 26, p. 362, Oct., 1923.
8. Zucker, T. F.: The Relation of Acid Base Equilibrium in the Body to Excretion of Phosphorus and Calcium. Proc. Soc. Exp. Biol. and Med., 18, p. 272, 1921.
9. Babbot, F. L., Johnston, J. A., and Heaskins, C. H.: Gastric Acidity in Infantile Tetany. Amer. Jour. Dis. Child., 26, p. 486, Nov., 1923.
10. Marriott, W. McKim, and Davidson, L. T.: The Acidity of Gastric Contents of Infants. Amer. Jour. Dis. Child., 26, p. 542, Dec., 1923.

11. Palm, T. A.: The Geographical Distribution and Aetiology of Rickets. Practitioner, 65, p. 270, 1890.
12. Raczynski, J.: Communication sur le Rachitime, etc. Compt. rend. Assn. intern. de pediat., p. 308, 1912.
13. Huldschinsky, K.: Heilung von Rachitis durch Kunstliche Hohensonne. Deutsch. Med. Wchschr., 45, p. 712, 1919.
14. Hess, A. F., and Unger, L. J.: Use of the Carbon Arc Light in the Prevention and Cure of Rickets. J. A. M. A., 77, p. 1596, May 27, 1922.
15. Hess, A. F., Unger, L. J., and Pappenheimer, A. M.: A Further Report on the Prevention of Rickets in Rats by Light Rays. Proc. Soc. Exper. Biol. and Med., 19, p. 238, 1922.
16. Hess, A. F., and Gutman, M. B.: The Cure of Infantile Rickets by Sunlight. J. A. M. A., 78, p. 29, Jan. 7, 1922.
17. Hess, A. F., and Lundagen, M. A.: A Seasonal Tide of Blood Phosphates in Infants. J. A. M. A., 79, p. 2210, Dec. 30, 1922.
18. Hess, A. F., and Weinstock, M.: Anti-rachitic Properties Imparted to Inert Fluids by Ultra-violet Irradiation. Trans. Am. Ped. Soc., June, 1924.
19. Hess, A. F., Weinstock, M., and Helman, F. D.: The Anti-rachitic Value of Irradiated Phytosterol and Cholesterol. Jour. Biol. Chem., 63, p. 305, March, 1925.
20. Hess, A. F., and Weinstock, M.: A Further Report on Imparting Anti-Rachitic Properties to Inert Substances by Ultra-Violet Irradiation. Jour. Biol. Chem., 63, p. 297, March, 1925.
21. Kramer, Benj.: Rickets in Infants. Treatment with Irradiated Milk. Amer. Jour. Dis. Child., 30, p. 195, Aug., 1925.
22. Shipley, P. G., Kramer, B., and Howland, J.: Calcification of Rachitic Bones in Vitro. Amer. Jour. Dis. Child., 30, p. 37, July, 1925.
23. Zucker, T. F., Pappenheimer, A. M., and Barnett, M.: Observation on Cod Liver Oil and Rickets. Proc. Soc. Exper. Biol. and Med., 19, p. 167, 1922.
24. Dubin, H., and Funk, Casimir: Studies in the Chemistry of Cod Liver Oil, etc. Proc. Soc. Exp. Biol. and Med., 21, p. 458, 1924.

DISCUSSION (Abstract)

Dr. James H. Park, Jr., Houston, Tex.—Dr. Von Meysenbug has given us an excellent summary of the rickets question. Rickets is not a disease of the tropics, where there is plenty of sunlight in the long summers and short, mild winters. The synthesis of the vitamin or anti-rachitic substance occurs only in the presence of ultra-violet light. The only source of ultra-violet light in nature, so far as we know, is from the sun.

Butter fat is the richest in vitamins of the ordinary natural foodstuffs. Rickets is practically unknown in countries where cod liver oil is used as a food, as for example in the Scandinavian countries.

If rickets appears in a breast fed infant, it means that the child has not had the proper exposure to sunlight or that the diet of the mother has been deficient in the anti-rachitic principles. If rickets appears in an artificially fed infant, it means that the child has been deprived of the proper amount of sunlight or that the food which it has received has been deficient in the fat-soluble anti-rachitic principles.

From the standpoint of public health it is deplorable that synthetic butter finds such ready sale into the homes where there are growing children. The vegetable fat is utterly devoid of fat-soluble vitamins. The animal fats, such as beef tallow, mutton suet and hog fat, contain only small amounts. Oleomargarin and allied preparations should have no place in the nourishment of the growing child, not on account of their energy content, but on account of their deficiency in fat-soluble anti-rachitic principles.

FURTHER OBSERVATION ON NON-SURGICAL DRAINAGE OF THE BILE CHANNELS

By ERNEST B. MILAM, M.D.,
Jacksonville, Fla.

Generations ago our grandfathers in medicine coined an all-encompassing term "biliousness" in an effort to describe a condition they sensed but could not prove. They recognized some direct connection between biliary and alimentary malfunction, and their indictment of the bile channels, unsupported as it may have been, in their efforts to place the blame for numerous alimentary disturbances, laid the groundwork for modern studies of bile channel disease. These modern studies have crystallized during the past decade into numerous individual efforts to draw aside the curtain obscuring both the normal function of these channels and their derangements so prevalent in this hectic age.

For the past five or six years the attention of internists has been directed to a rather revolutionary method of diagnosis and treatment of malfunction of the biliary tract. When Lyon and Melzer first announced the results of their experimentation with the duodenal tube in mechanically inducing drainage of these passages without resort to surgery, a sudden surge to the use of the device resulted, and, as is always the case with any radical departure from orthodox methods, the most contradictory and confusing results were soon being reported. The reason was quite evident. Poor selection of cases, faulty technic, overzealousness, slovenly methods, especially among busy practitioners, and a host of misapplications soon bade fair to overwhelm what merits the device may have had and to bring about its discard without even a semblance of reasonable, painstaking trial. Fortunately a number of thoughtful internists, especially in the field of gastro-enterology, recognized the possibility of great value in the method, and set out to test it in numerous clinical cases. The recognition became fairly general that here was a method with at least high promise, and that the very obscurity of the conditions attacked and their widespread incidence would justify careful and prolonged effort in its application.

The writer here wishes to state that in the following discussion he lays claim to no originality of method; that he was probably one of a

*Read in Section on Gastro-Enterology, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

large majority who wished to be shown; that on adopting the method immediately following its original announcement he did so with an open mind, ready, after prolonged and fair trial, to prove and accept, or disprove and reject, and to admit that after lengthy trial and some modifications of technic he became convinced that fundamentally the theory of the device was sound and rational and offered a wide field for further study. The following observations are offered following such study over a period of several years. No qualifying statements will be made, and theories will be advanced only where definite facts have not been proved. No brief will be held for the originators and developers of the idea, for none is needed. The ensuing observations are the writer's own, covering his individual work. A review of literature on the subject is not attempted for two reasons: First, because the period to be so covered, owing to the youth of the method, is too short and recent to offer a proper perspective, and second, because opinions to date are so divergent and in many cases so unreliable as simply to increase the confusion that now exists.

In this discussion references to the bile channels are intended to include the secretory hepatic cells, the collecting hepatic ducts, the main hepatic duct, cystic duct, gall bladder, and the common bile duct; in other words, all of the channels concerned with the elaboration and discharge of bile from the cells secreting it in the liver to the end of the duct emptying it into the duodenum. Disease of the bile channels, as we know, may manifest itself in any or all of these regions, even may be a primary involvement of nerve supply to the secretory hepatic cells. The significance of the term "obscure conditions" immediately presents itself.

A brief review of some biliary characteristics may assist us in approaching the essentials of this discussion, and in realizing the theoretical correctness of the method being discussed when applied to properly selected cases.

The anatomy of the liver and the bile passage is familiar to you. The physiology of the tract and the functions of its secretion are more elaborate than their apparent unimportance might lead us to believe. The older practitioners recognized their disturbances, in conjunction with those of the intestinal tract, to be very common, and were prone, as we may infer, to apply to them the descriptive term "biliousness" already mentioned. Recent experiment and study demonstrate that the term is inadequate and misleading, and that the liver and bile channels are a quite complex and highly specialized group-organ. More of the physiology and function of bile is yet to be learned, but this we know: normal bile has at least two important offices, first, it is a vehicle for the elimination of waste products thrown off by the great filter, the liver, and second, it is an aid in intestinal digestion and absorption. Broken-down blood cells and debris and many of the products of catabolism are filtered from the body by the liver and are elaborated in the bile for elimination by way of the intestinal tract. Coincident with the office of elimination, the bile has been assigned a further function by nature, its aid to the intestines as stated above. Most physiologists seem to agree that it assists in the emulsification of facts, acts as an extremely necessary lubricant for the alimentary tract, and as a mild disinfectant for the upper and lower bowel.

Now here we have a peculiar situation in body economy. We have a body fluid which is at once excretory and secretory, whose function is that of an important adjunct to digestion and assimilation, and at the same time is that of a vehicle for the elimination of waste products dissolved within itself. Physiologic function of the liver being normal, this dual function is performed undisturbed, but let congestion of the bile tract or of the intestinal canal, involvement of the liver, infection even of some distant organ develop, and it can readily be seen that a hazard promptly ensues. Where we have had a normally flowing stream promptly carrying its waste products out of the body, we now have a stream the very nature of which, having become stagnant or arrested, promotes an open door for fermentation and putrefaction, and provides a perfect medium for the development of pathogenic bacteria. The gall bladder, whether it be simply a reservoir or, as is more probable, acting as a pressure equalizer, now appears in the limelight; for, no matter in what part of the bile tract involvement may begin, the gall bladder in a great majority, if not all of the cases, soon becomes affected. Its very nature as a reservoir, its location, form, and dependence upon a small duct for drainage all tend to make it a ready seat for degeneration and infection of its contents when malfunction of some part of the tract exists.

It is the belief of the writer that relatively few, if any, gall bladder diseases occur primarily in the gall bladder itself, where the rest of the bile passages, the flow of the bile, and intestinal elimination are normal, but that they occur secondarily to involvement outside itself. Experi-

ence further bears out the belief that in a general bile passage involvement, the gall bladder is the last unit to assume a normal state under therapeutic methods applied directly to these channels because of its same peculiarities mentioned above as aiding infection.

From the very nature of the fluid it carries and its own physical characteristics, the biliary system offers a ready field for pathologic involvement when its functions are disturbed from any cause, and as we know that these functions are closely related to those of alimentary elimination, disturbances of which are so woefully common in this age of mental advancement and physical neglect, we can understand why cholecystitis, cholelithiasis hepatitis, and kindred involvements are prevalent. But recognizing these conditions in their incipiency is not easy, nor is it usual. Time prevents a more detailed discussion of biliary characteristics, and we may now turn to the use of the duodenal tube in diagnosis and treatment.

THE USE OF THE DUODENAL TUBE IN BILE CHANNEL AFFECTIONS

Bile channel involvements may be manifested by symptoms as unmistakable as those of gallstone colic or obstructive jaundice, or by symptoms so obscure or irrelevant as to engender no suspicion of biliary disease. The latter are of such frequence that the writer places bile tract involvement along with hookworm as among the first conditions coming under process of elimination in all gastro-intestinal cases presenting themselves other than children.

The orthodox symptoms of biliary diseases are familiar to you. The newer phases of symptomatology are elaborated in a number of recent contributions to medicine. Remembering that of the five great areas of focal infection, namely, sinuses, teeth, tonsils, gall bladder, and appendix, stagnant bile offers probably the most fertile soil for bacterial growth, and remembering its coincidental involvement with many conditions so common in the bowel, it can be seen that a deaf ear should never be turned to symptoms, no matter how obscure they may be, that might indict the bile channels.

The observations that I now offer are based on a careful study of over 300 cases of biliary disease. They serve as a plea for the careful use of this expedient to which I have been referring. The duodenal tube offers to the writer a useful device superior to all others in aiding in the diagnosis and treatment of diseases of the bile channels: first, in the reclaiming of gastric contents, the analysis of which should always be made in suspected bile channel involvement. The duodenal tube is infinitely more to be preferred than the old-fashioned stomach tube, both from the standpoint of ease of manipulation by the operator and of comfort of the patient. The tube is easily passed, the stomach contents obtained, and the patient placed in the proper position for the tube to pass by gravity into the duodenum. The time required for the latter to occur may be from one-half to three or four hours, depending on several factors. In cases of pyloric spasm an overnight period may be required. When the bulb is in the duodenum, normal contents of the latter may be aspirated for determining pancreatic function. The writer introduces his solutions into the duodenum to stimulate the blow of bile. Various solutions have been used for this purpose, the more common ones being those of sodium phosphate, sodium sulphate, magnesium sulphate, and magnesium citrate. Others are used as are combinations of two or three. The writer has found the one best suited to be a saturated aqueous solution of magnesium sulphate in a manner to be presently described.

NOTES ON DIAGNOSIS

In considering the question of the physiologic action of the solutions instilled into the duodenum, we find that controversy stalks forth to steal our attention from the salient points of interest. To the writer this question of physiologic action is of secondary import to the result obtained. Whether it be stimulation of the duodenal mucosa with contraction of contiguous structures, direct stimulation of the nerve endings in the mucosa and reflexly of the gall-bladder musculature, reflex stimulation of the hepatic secretory cells, whether it acts as a solvent of obstructive material or performs all of these phenomena combined, or still others, is not fraught with much importance. A factor of much greater moment is in evidence, namely, that bile flow is increased and becomes more rapid when the solutions are instilled directly into the duodenum. The writer has observed cases of acute obstructive jaundice where no bile would flow immediately following the installation, but where later there would suddenly be a veritable gush of bile containing flocculi, plugs of mucus, disintegrated cells and debris, which inclines one to the belief that in some cases non-solid obstructions of the common duct have simply been dissolved by the solution used and free flow instituted.

The changes of color in normal bile, as you know, are found to be marked and to be of considerable significance as a basis of comparison with those of abnormal bile channel contents. The first bile is light, clear, lemon-colored. It later becomes darker and more viscid, this probably from the gall bladder; still later it is again light golden yellow, probably from the hepatic ducts and cells. The chief point of interest is that abnormal bile, from whatever part of the channels it may come, has characteristics markedly at variance with those of the normal fluid. In a majority of cases of the involvements under discussion, this is the picture that the bile discloses: After the first light colored duodenal contents, bile appears that is thick and viscid, dark green colored, muddy yellow, or even tarry black. It contains particles of flocculi plainly visible while drainage is in progress, and it is ropy and evidently full of mucus, all of this in contradistinction to normal bile. Now it is unreasonable to assume that we can blindly assign pathologic bile to certain definite parts of the bile channel with the same assurance that we do with normal bile, and in my opinion it is not necessary to do so. As stated previously in this paper, and as borne out by observation on these cases, the gall bladder is practically always itself involved, and our attention should center upon this organ, especially as medical treatment is essentially the same whatever the part, or parts, involved.

Microscopically, pathologic bile was found to present some or all of the following features, depending upon the degree of involvement; mucus, shreds of epithelium, white blood cells often to the extent of pus, red blood cells, fragments of mucous membrane, bacteria, and often cholesterin crystals and fine particles of sand-like material. The latter two features point strongly to gallstones, the others to different degrees of infection. Culture of such bile usually develops the presence of Staphylococcus albus, the significance of which I am not prepared to discuss, as I am not certain that uncontaminated bile-channel contents can be obtained by the duodenal tube, and, furthermore, have at various times found what was apparently normal bile obtained through the tube to be in some cases positive and in others negative for the micro-organisms mentioned.

It is reasonable now to assume that the presence of such abnormal bile as has been described prompts the diagnosis of bile channel pathology. In those cases where gallstones are indicated, unquestionably surgery is the proper method of treatment, and delay increases the hazard. But even in these cases, where age or general physical condition makes surgical procedures inadvisable, definite palliative effects can be obtained by the duodenal lavage which will presently be described.

I might here remark that it is, of course, understood that the duodenal tube is used as a diagnostic measure in conjunction with the usual expedients such as history, complete physical examination, examination of the stool and urine, of the blood, use of the x-ray with dye injections, etc. Conversely, any attempt to diagnose other than the patent and unmistakable bile channel involvements without recourse to the duodenal tube is denying oneself the use of one of the most potent measures at hand.

TREATMENT

Assuming now that we have a diagnosed case of non-surgical lesion of the bile channel in which eliminations by medical treatment are indicated, how shall we best attack it? The following is the writer's routine: Treatment should incorporate the usual procedures of proper alimentary elimination, dietetic, hygienic, general symptomatic, etc., except that the use of the cholegogic salts given by mouth in the old way is not indicated, as the duodenal installation accomplishes the same thing directly and with much greater certainty. The writer believes that proper preparation in duodenal lavage is a primary essential. It should include placing the patient in as comfortable a position as possible where complete quiet and rest are assured. The patient's frame of mind should be considered and assurance be given that, although the period of drainage is going to be long and tiresome, no ill effects can result, and, furthermore, that definite improvement and often complete relief can be reasonably assured him.

The routine treatment through the tube is as follows: 50 c.c. of the solution chosen is allowed to enter the duodenum by gravity and to remain five minutes. It is then either aspirated with a syringe or, as the writer prefers, allowed to return by gravity, the distal end of the fluid-filled tube being depressed three or four feet below the level of the prone patient, thereby instituting syphonage. While this method may be somewhat slower than that of forceful aspiration, it is preferable because the suction is then gentle but constant, and free from the possibility of causing abrasions of the duodenal mucosa by suction too vigorously applied. Bile flow is established after a waiting period dependent

upon the degree of congestion, especially of the common duct, and may be immediate and rapid or delayed and slow. Periodic flow and cessation develop, as a rule, every alternate few minutes. Flow is further increased by gentle massage of the gall bladder region, and is sometimes markedly increased by the patient's sneezing, coughing or laughing, this, of course, being due to the increased intra-abdominal pressure. The induced flow may be maintained indefinitely, from an hour or two, in neurotic patients, even to several days in those who desire the maximum of immediate effect by submitting themselves to the longer period of treatment. The end in view is the reclamation of clear, normal bile. While this is not possible in one drainage in all cases, even when carried out for the minimum of 8 to 10 hours continual drainage, in other cases one prolonged drainage accomplishes the desired result often with cessation of symptoms for periods of from several months to years. The reason for the end desired being the flow of clear, normal bile resolves itself into the essential of the treatment. Be the condition common duct obstruction by inflammatory products, inflammation of the gall bladder, or of any part of the bile passages, the object is the removal of the inflammatory products, the emptying of the gall bladder of its infected bile, and the stimulation of bile secretion, for as soon as the abnormal contents are removed the flow of normal bile institutes a mechanical washing out of the tract, and stimulates a return of normal secretory function.

Too much stress cannot here be laid on the absolute necessity of prolonging the period of drainage at each sitting to a minimum of 10 hours instead of the inadequate two or three-hour periods so generally deemed sufficient. Such proper use of the method just described in a great majority of cases brings ample reward, and we accomplish by it in a very short time what the older medical methods of orally administering cholegogues required weeks and months to do, with many cases showing little or no improvement.

At the risk of being charged with overzealousness, one is tempted to step across the boundary to the side of the patient and hear what he himself experiences following the application of these measures. The results, as in all the field of therapy, are not constant, and never will be; but in a large majority of intelligently selected and properly diagnosed cases definite improvement is constant. After all, the essential of all our efforts in medicine is relief of symptoms after their cause is determined. Symptoms are the patient's one vital concern. Their consistent reports of relief from the long train of annoying symptoms of chronic biliary stasis with proper use of the measures outlined is ample reward for the painstaking care and industry necessary for their successful employment.

CONCLUSIONS

(1) Aside from the fact that it is a valuable adjunct in diagnosing the conditions of the bile channels in suspected pathology, the duodenal tube supplies a method of treatment which offers much reward if carefully and skilfully applied.

(2) The essential for maximum results in treatment is continuous drainage over much longer periods of time than is apparently now customary.

(3) We are only on the threshold of knowing what this agent may mean to the vast number of chronic alimentary disturbances surrounding us.

The writer again wishes to state that the foregoing conclusions are his own and are based on his personal observations. Others are engaged in this work. Many of them have observed series in excess of his in numbers, and their conclusions may not be in accordance with his on many points. But as the work goes on, contentions will be adjusted with time and study, and medicine will be the gainer.

201-2 St. James Building.

DISCUSSION (Abstract)

Dr. J. Russell Verbrycke, Jr., Washington, D. C.—I shall not discuss whether or not biliary drainage empties the gall bladder. I wish only to sound a note of warning against the too protracted use of the method for treatment, if a permanent cure does not result at first.

The medical treatment of gall bladder disease should be comparable with that for peptic ulcer. If one thorough medical treatment for peptic ulcer is followed by a recurrence, experience teaches us that any subsequent medical treatment will result in failure to cure. Likewise, if one thorough course of treatments for cholecystitis by biliary drainage should be followed by a recurrence of symptoms, this is proof that there has still remained a focus of infection which will probably be permanent and for which the gall bladder should be removed. In no condition is early surgical removal followed by as complete results with safety and late operation followed by more incomplete cures and greater risk.

Dr. Daniel N. Silverman, New Orleans, La.—The question of gall bladder drainage by the intraduodenal instillation of magnesium sulphate solution has been under experimental investigation by Menville and me since the introduction of gall bladder visualization by Graham and his associates. Our studies have shown

that the gall bladder does drain and, until scientific evidence to the contrary is presented, we shall adhere to that opinion. Repeated stimulations of the duodenal mucosa produce constant reduction in size of the gall bladder. In certain instances of pathological gall bladders that do not drain, it was noted that the so-called "B" bile was not recovered.

Dr. Evarts V. DePew, San Antonio, Texas.—My experiences have led me to concur with Dr. Milam in his conclusions as to non-surgical drainage of the bile channels.

We may not know just how the gall bladder is drained, whether it is by contraction or otherwise, but recent studies with the aid of the Graham method have shown without doubt that the gall bladder does empty after the introduction of magnesium sulphate into the duodenum by means of the duodenal tube. There is no doubt that many cases are given relief by medical drainage. This is more important, even though it would be very interesting to know exactly how it was accomplished.

The non-surgical drainage of the bile channels has given me gratifying results in a certain class of patients. This condition has been in connection with gastric and duodenal ulcers. A few cases which have not yielded to medical ulcer treatment have shown marked improvement after medical drainage of the bile channels. These cases showed no manifestation of gall bladder trouble, or so slight that the ulcer symptoms overshadowed them.

From a therapeutic standpoint, I believe its greatest value is in the milder cases and in the reasonably acute and subacute cases. In many of these cases the drainage may prevent a chronic condition which necessitates surgery.

It aids in a diagnostic way as Dr. Milam has brought out. In addition to this, I believe it aids in diagnosis in more or less obscure cases when drainage gives only temporary relief. This, in my judgment, shows more convincingly that a gall bladder pathology exists and surgical interference can be more urgently insisted upon.

Relief is what a suffering patient is seeking, and if non-surgical drainage of the bile channels gives this relief it should be used. If diagnosis of the upper right quadrant can be aided by the use of the duodenal tube, it should be kept in the medical armamentarium.

Dr. Tate Miller, Dallas, Texas.—There are a number of things that we do not know about biliary drainages. It is generally noted that the same dosage of magnesium sulphate given into the duodenum does not have the same purgative effects that it would have taken by mouth. It is also noted that, with the duodenal tube in place, that the dose of magnesium sulphate given by mouth will not result in the same character of biliary flow that it will have given through the duodenal tube. This may be due to the free flow of gastric fluid which dilutes the saline solution until it is rendered more isotonic before it reaches the duodenal mucous membrane and lessens its stimulation to the gall bladder. I do not know which side to take in the discussion as to whether the drainage gotten is due to the stimulation of the liver or of the gall bladder, but I am inclined to straddle the fence on this proposition and feel that the saline solution acts in the same manner as, but more actively than, food passing out of the stomach does; that it stimulates the gall bladder contraction and the liver to a greater activity.

We have not practiced the long-drawn out drainage of six to eight hours, because if the primary purpose is to drain the gall bladder, and if the "B" bile represents the gall bladder drainage, we have discontinued the drainage when we were no longer able to get the dark "B" bile. We are not always able to estimate the amount of benefit the patient has gotten by the amount of bile gotten back in the little bottles, because it is thoroughly possible to get a free drainage without the duodenal tubes picking up the return. What we get is a sample and not the whole drainage. It is a frequent occurrence to have a patient state that he got an unusual amount of benefit from the drainage when only a small amount of bile was removed.

The progress of the case to be reported is the best evidence that I have that the gall bladder is really drained. The patient had the typical gall bladder disease symptoms, history and findings, and an associated urticaria that had been very constant for the preceding year. She was operated upon and a surgical drainage of the gall bladder done with relief of the gall bladder symptoms and complete relief of the urticaria for a period of 10 weeks when the urticaria again showed up, with some return of the gall bladder symptoms. At this time a non-surgical drainage was done with equally complete relief of the urticaria for about another 10 weeks. This urticaria has for the past two years continued to occur at intervals of every two or three months, and each time the improvement that followed the non-surgical has duplicated the relief that she got from the surgical drainage.

We have secured remarkably good results in those cases of urticaria that result from eating certain foods, and good results in those migrain headaches in which the spells are preceded by a ravenous appetite.

TROPICAL DISEASES AND PUBLIC HEALTH

THE CHILD HEALTH DEMONSTRATION*

By Bernard W. Carey, M.D.,
Director, Athens Child Health Demonstration,
Athens, Ga.

The idea of carrying on demonstrations of a public health nature is not particularly new. In past years philanthropic organizations or groups of individuals have conducted such activities. These have been more or less experimental in type and usually of a dual nature: first, they were concerned with development of procedures, and, second, with the problem of having the work developed taken over and carried on by governmental or voluntary organizations. However, in times past it was often supposed that the development of separate organizations was necessary and that these could best function if independent of any other that might be in existence. It is needless to point out that this policy resulted in duplication of effort and was the occasion of much misunderstanding.

From the experience of these earlier demonstrations came the desire to show what progress could be made when all local health agencies and a demonstration unit were banded together in a cooperative effort.

Of the many health problems which remained to be solved those surrounding mother and child challenged the attention of the Commonwealth Fund. Here were conditions theoretically susceptible of marked improvement through the application of public health principles and practices. The Commonwealth Fund, therefore, called together a Child Health Demonstration Committee and proposed to finance four demonstrations in communities widely separated and presenting varying conditions in which the child health needs in this country might be studied and more or less adequately supplied.

In choosing demonstration sites many factors were considered by the committee. Most important of these were:

(1) The child health problems of the community and the attempts that local authorities had made to solve them.

(2) The attitude toward the proposed demonstration of the various local agencies and their willingness to participate in the program.

(3) The probability of governmental and volunteer agencies' eventually carrying on permanently the essential parts of the program, and assuming financial responsibility for it as the work progressed.

The wisdom of these fundamental requirements has already been demonstrated, for the communities selected are gradually assuming financial responsibilities, and the cooperation of professional groups and local volunteer organizations is unusual.

The cost of public health activities has always been restricted by community budgets. While it is perfectly proper, indeed essential, that the relative importance of each municipal need should have the most careful consideration, it is also true that public health budgets are generally inadequate. This is perhaps due to the fact that the education of our people, and particularly members of the appropriating bodies, has not kept pace with the results accomplished in the field of public health.

On this subject the General Director of the Commonwealth Fund writes in the eighth annual report as follows:

"If the county school teacher of Ichabod Crane's day could return to earth and acquaint himself with the modern educational system and its cost, his economical soul would doubtless receive a severe shock. The per capita costs of public education today and a hundred years ago are not comparable. It is possible that we are guilty of extravagance in education. There are authorities of weight who think so; but it would be difficult to find a city or county in the United States which could be justly accused of the same sin as far as its public health expenditures are concerned. On the contrary, a conviction of a parsimonious attitude might be obtained against a very large number. In a recent issue of "Better Times" it is noted that the American people expend 65 cents per capita each year on coffins and 11 cents on health service.

"The field of public health service is admittedly different in many respects from that of education. Possibly it will never be necessary or advisab'e to expend such large sums in that field. It is certainly clear that the educator of 1824 would have considered the modern expenditure for education impracticable and unnecessary, if not unthinkable. Yet a per capita of $20 and more is not uncommon today. The health worker who believes that 50 cents, or even a dollar, is the per capita limit, for a community health budget may be quite as overconservative as the early Nineteenth Century educator. Public expenditure, whether official or voluntary, is largely a matter of public understanding and appreciation. It grows with understanding, provided the value be real, and the public usually gets an approximately accurate picture of value in the long run. The fact that a certain city in the United States expended

*Read in Section on Public Health, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

last year less than 12 cents per capita on public health indicates that that community does not see the utility of a larger expenditure, not that it never will see it or that potentially it does not exist. Certain American cities are today expending more than a dollar per capita. Who shall say in future years the public will not permit, even demand, an expenditure of five dollars?

"The Commonwealth Fund frankly approves a per capita expenditure in excess of the usual in the health demonstrations. It also recognizes that progress to be sound must be reasonably slow and steady; that a figure may rightly be regarded as excessive today which fifty years hence, or even two years hence, will appear low. Therefore, thoughtful consideration has been given to the operation of a health program sufficiently complete to cover essential needs, with a budget not large enough perhaps to cover every activity desirable in an ideal program; not too large to be a practicable possibility for the community concerned and for other similar communities, but large enough to meet existing needs with reasonable adequacy and to assist in pointing the way toward a reasonable and justifiable increase in the average health budget."

No small part of the demonstration's efforts will be concerned with the education of the community as to the necessary cost of an adequate piece of work, and through the results demonstrated it is believed that a demand will be created for a more adequate permanent program.

The program of the demonstrations can be briefly defined as an attempt, with the established health agencies of the community, to improve the health of the mothers and children in the demonstration area. The demonstration's cooperation may, and does, take on various forms. It is not planned to establish a new service or agency in any of the demonstration areas where one is already in existence. Organizations which are not functioning at their maximum efficiency will receive necessary assistance, and only where it is impossible for local organizations to assume responsibility for work will the demonstration undertake that part of the program.

The Demonstration Committee realized that no fixed program for the demonstrations as a whole could be definitely arranged, but rather that each center must be studied and a program developed which would best meet the needs of the community to be served. It is believed that under these conditions there can be established, through the cooperation of the local health agencies and the Child Health Demonstration Committee, programs which will permanently advance the health and well-being of the community to be served.

The fundamentals of such a program can be set forth in the belief that:

(1) No mother should die or be injured in child birth because of lack of knowledge on her part or of proper medical and nursing attention.

(2) Every baby should be born under circumstances that will insure a healthful and vigorous start in life so far as may be possible.

(3) Every child should have the advantage of wholesome living conditions and of health supervision which will maintain freedom from defects and facilitate a sturdy development.

(4) All boys and girls should learn those habits and acquire those ideas and attitudes which will contribute most to the making of strong bodies and minds, and the preparation for the greatest usefulness to their fellow citizens and to their country.

A successful demonstration should, therefore, show:

(1) How far the assistance of such a committee as that formed by the Commonwealth Fund can help a more or less typical community to develop and organize its resources for saving the lives of mothers and babies, and for promoting the health, strength and sound development of children of all ages.

(2) What is the relative value and cost of some of the measures to this end, as far as this can be determined in the brief period of five years.

(3) What particular lessons can the average community, not assisted by outside funds, learn from such a demonstration.

To answer these questions, the Athens Child Health Demonstration has been organized under four divisions: administrative, medical, nursing, and health education. The activities of each division, in the main, are indicated by its title. The administrative division takes care of the administrative problems that arise, the financial and statistical activities, the stenographic and clerical work. The medical division, in charge of a well trained pediatrist, assists the county health officer in the health examinations of the schools and conducts the well baby conferences in different sections of the city and county. The nursing division, with a director and five public health nurses, is carrying on a generalized program of nursing in city and county. In the health education division there is a director of health education, a director of physical education and an oral hygienist, all of whom have been officially appointed by the Board of Education in the city school system.

Every effort has been made effectively to correlate the work of the various divisions. This, perhaps, is best illustrated by the health education work, where the medical, nursing and health education divisions all contribute to the program with all records tabulated by the demonstration statistician. In the posture work conducted by the demonstration, the physicians and the physical educator work in unison, discussing together the various postural conditions. The

nursing division, in collaboration with the director of health education and the pediatrician, undertakes to give health instruction to expectant mothers, instructions to the midwife, and to secure health supervision for the infant, preschool, and school groups. Special conditions in need of improvement, such as malnutrition, receive attention from the medical, nursing and health education divisions of the demonstration.

The demonstration does not encroach on the field of the family physician to whom all children needing treatment are promptly referred, and cooperation with the medical and dental professions, as well as with voluntary associations, has been secured to a marked degree. Early in the life of the demonstration the Tuberculosis Association requested the privilege of participating in the demonstration program, and the nurse employed by it now has an office in the demonstration headquarters, and the demonstration nurses assist in the local tuberculosis program.

Thirteen physicians from the Clarke County Medical Society have banded themselves together to establish an out-patient department at one of the hospitals in order that the indigent child in need of remedial measures may secure attention. The members of the dental profession have given an afternoon each week for corrective work for children brought to them by the oral hygienist.

The cooperation of the City Council, Board of Education, and the citizens generally, has been of a very practical nature. The Board of Education from the beginning has paid a part of the salary of the director of health education, and appropriated money for the necessary scales for every school building, milk for certain indigent school children and for other things necessary in the development of the health education program.

The City Council almost a year ago appropriated funds to pay the salary of the bacteriologist, which was originally paid for a time by the demonstration, and also has furnished office space and equipment for the demonstration in the City Hall.

Athens is fortunate in having a Board of Health that shows an unusual interest in its problems. The county health commissioner is a well trained, energetic public health official, who has been unusually successful in popularizing the health program. The demonstration has been able to cooperate with the Board of Health through the furnishing of a part of the salary of the bacteriologist as already mentioned and through the nursing division, which takes care of visits necessary in connection with quarantine and isolation, bedside care and immunization work.

The Board of Health in turn is of assistance to the demonstration in various ways, as illustrated by the fact that the laboratory examines all specimens submitted by the nursing division, including urine, blood, feces and sputum.

The interest of local citizens has been manifested practically by the raising of funds for playground equipment and supervision, and furnishing volunteer assistance in carrying on the other parts of the demonstration program. This assistance was especially valuable during the past year when an attempt was made to examine children before they entered school for the first time. Under a "block mother" system the mothers of the pre-school circle visited the homes of children known to be entering school for the first time, and urged that they receive health examinations either at the demonstration health center or from their private physician so that defects might be corrected and immunizations made before the children entered school.

Another index of community interest in the program has been the presence of parents, particularly mothers, at the regular school health examinations. This attendance, of course, varied from school to school, but our records show an average of over 50 per cent of parents present, at times reaching as high as 87 per cent in one school, and in a colored school 67 per cent. This interest has a very practical consideration, for it is not unusual to have the mother leave the examining room, go to the telephone in the principal's office and call her family physician, making an appointment for examination whereby the diagnosis made by school physicians might be confirmed, and steps taken to correct undesirable conditions.

It has been a fixed policy of the demonstration to refer all cases needing correction to the family physician. This policy as well as that of advocating periodic examination of the supposedly well child has never been departed from, and evidence is seen that the subject of preventive pediatrics is more and more in the minds of the practicing physician. This seems to be a very definite service which should go far toward

establishing the ideal of preventive child health work by the local medical profession.

In reviewing the accomplishments of the past year and studying the trend of progress, it seems increasingly evident that a demonstration, no matter where located, can achieve its maximum success only through the development of cooperative relationships with the medical profession and other professional groups in the community. Through such relationships many of the stumbling blocks to progress in public health have been removed and the ideal of public health activity securely resting in the hands of an interested, sympathetic and well trained medical profession is becoming increasingly possible of realization.

DISCUSSION (Abstract)

Dr. H. S. Mustard, Murfreesboro, Tenn.—No child health demonstration is set up as a complete program. It is organized only as a reasonably adequate program in child health, and is not instituted in any community unless those factors necessary for a complete program are available, or may be made immediately available. For instance, in Fargo, N. D., the child health demonstration supplements, in its special field, the work of the local health department; a similar condition exists in Athens, Ga.; and in Rutherford County, Tennessee, there being no organized health department, the director of the demonstration is health officer of the county, and the organization conducts a complete health unit program. No health program will be successful in its broadest sense if it limits itself to the problems of any particular disease or age group to the exclusion of other things.

I think it can be said without contradiction that a large part of a successful health program must be concerned with the child and his environment. By child, I mean beginning with the prenatal case and going through adolescence; and by environment I wish to include everything from home hygiene to sanitary toilets. As avenues of procedure, we must consider as very important the public health education of the community and the child, and the stimulation of the practicing physician to participate in preventive medicine, making it a routine in his daily work. In the demonstrations we do not claim to have established or to demonstrate a panacea for community ills. We do know, however, that the present knowledge of medicine and science is many years in advance of the practice of these things. The question the demonstration is attempting to solve is this: May we, by using the child as a point of attack, demonstrate the feasibility of bridging the gap between unapplied and applied knowledge and, by bridging this gap, prove not only to the communities in which we work but to the country as a whole the value of the application of modern scientific knowledge?

MORBIDITY REPORTS IN COUNTY HEALTH WORK*

By Roy K. Flannagan, M.D.,
Assistant State Health Commissioner,
Richmond, Va.

The author disclaims any thought of originality for the plan herewith outlined.

The Key to Disease Control.—The front door to the control of infectious disease is, as every health officer knows, immediate knowledge of its whereabouts. This door is generally locked. Few city health officers have a key that is properly adjusted and practically no rural health officers have one that works satisfactorily. The physician is the key to this door, and some way must be found to get him to work smoothly so that our disease control edifice will be a hospitable temple of health with a freely swinging front door.

The country health officer is tired of sneaking in the back way in order to do the work the public expects of him. His position is one of the highest importance to the community and anything that lowers its dignity is decidedly not in the public interest.

Health officers, rural as well as urban, eventually get the facts and eventually they meet the issue, but valuable time is lost, the public welfare suffers and health department prestige is weakened.

Immediate Reports Necessary.—The health officer is entitled to know within the hour, if possible, the what, where and when of suspected contagion. Any plan, therefore, by which prompt reports of communicable disease may be obtained will be a boon to him. Any scheme by which a rural health officer may secure such reports will be more than a boon. It may mean his salvation, for a severe epidemic has banished many a health officer, and the prompt control of a potential epidemic has more than once established a shaky department in public confidence.

The Attitude of the Public and the Physician.—The situation is this: An epidemic comes through lack of early information which the practicing physician alone can supply. As we said, he is the key to our difficulty. The man in the street does not see this. He says: "If a

---

*Read in Section on Public Health, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

health department cannot prevent epidemics, what good is it anyway?" This question is embarrassing, and it comes about that the most important public enterprise of all is thus placed on the defensive. It does little good to scold delinquent physicians, and, in my experience, no good at all to prosecute them. Of course, they ought to report their cases of infectious disease promptly. They know they ought and the informed public knows they ought. It is a pity that all physicians are not equally socially minded, unselfish and patriotic, but the fact remains that they are much like other people. Some are more forgetful, some more cantankerous and some more mercenary than others. All of them, however, have an abundant supply of human nature, and they appreciate consideration.

The Cooperative Physician.—The conscientious physician reports a case of suspected scarlet fever, diphtheria, smallpox or typhoid, and has a pleasant glow of satisfaction that he has done his duty and perhaps nipped an epidemic in the bud. So far as he is concerned, frequently that report is the last of it. The health officer acts on the knowledge sent in or not (as the case so often is) and the physician has nothing more to remind him of public health work until, without compensation, something more is required of him. It is not surprising then that he sometimes seems unenthusiastic and uncooperative toward public health demands upon him.

How Cooperation Is Gained.—The most satisfactory method of correcting this condition is simply to acknowledge the physician's reports, acknowledge them regularly and give him briefly an accounting of the cooperation he has lent. Practically all of the indifference on the part of physicians now is overcome by this simple means in a number of Virginia county health departments.

Each practicing physician in the county receives a weekly letter from the county health officer acknowledging his help and telling him about the prevalence of disease in the county as culled from reports of all the physicians, together with a note upon the activities and plans of the department. These letters are necessarily short, but they introduce a new note in our health department practice that is getting results, and they much more than repay the cost and time devoted to them. This plan makes each physician not only an adjunct to, but an active partner in, the county's health work.

Public Health Service Aid.—The United States Public Health Service, through its collaborating epidemiological organization, solves the question of postage. The health officer and his office clerk, if he has one, do the rest. For the plan to be completely successful, there should be first a full-time health officer at work in the county.

This method of securing reports was established in Virginia by Dr. I. C. Riggin, now Health Officer of Oberlin, Ohio, formerly Epidemiologist of the Virginia State Board of Health.

Details.—The details of his plan are as follows: the State epidemiologist or the local health officer, or both, visit the local medical society and, if possible, visit each individual physician and talk the situation over, show the type of report to be used, how these should be filled out and other essential data.

A blank report, with the name of the physician on it, is mailed to each physician in the county on the same day each week, together with a franked envelope for its return. A letter is enclosed giving information as to the health conditions of his county, the number of cases of communicable disease reported the previous week and any matters of health interest occurring in the county or in the State.

In Absence of a Health Department.—It is, of course, possible for the State Board of Health greatly to improve its morbidity returns by this plan, even in counties where there is no local whole-time health officer. In fact, we have done this in one county. The close touch necessary for satisfactory disease control work in such case, however, is lacking, for prompt visits and attention to reported cases are impossible at long range. An epidemiological staff at the State Board of Health of sufficient numbers to cover the State is impracticable.

In Whole-Time Health Departments.—In counties where there are full-time health departments the local health officer forwards the report blanks to the physicians and writes the letter to the physicians showing, among other things, the use to which the information furnished is put. The facts gained from the physicians are first acted on where necessary and are then tabulated and promptly forwarded by the health officer to the State Board of Health.

These reports give the name of the patient, the disease, age, sex, color, location of case and the name of the physician. The data required

is for immediate use and is stripped to bare essentials.

We have found that through this method the percentage of physicians reporting is much higher, and a greater measure of disease control is thereby made possible.

Special Advantages.—The health officer is brought into close touch by this weekly communication with all the physicians in his jurisdiction. They come to know him, his purposes and plans, and as their help is shown to be appreciated by him the support of every right thinking physician among them is assured. The time spent by the health officer in this correspondence is justified by every public health consideration. The fact that there are so few physicians now in the country makes the task from a clerical standpoint comparatively easy. The writing of from 10 to 40 letters weekly to gain the full support of the medical profession to health work is a small price to pay.

Morbidity Areas.—Dr. B. J. Lloyd, Assistant Surgeon General of the United States Public Health Service, advocates the establishment of a registration area for morbidity reports. The interesting and appealing part of his scheme is that the local jurisdiction (city or county) is the unit instead of the State as in the case of birth and mortality registration. I believe there are several counties in Virginia that would now qualify for registration under Dr. Lloyd's plan.

Virginia Disease Control Law.—The State of Virginia has a law in its code (Section 1515) which requires that:

"Every physician practicing in the Commonwealth who shall know or suspect that any person whom he or she is called upon to visit, or who comes to him or her for examination or treatment, is suffering from an infectious, contagious, communicable or dangerous disease, shall make report in writing on blanks to be furnished for that purpose by the State Board of Health to the executive of the Board of Health. * * *

"Any physician failing to comply shall be fined not less than one nor more than five dollars."

Honored in the Breach.—This law is good, and one of these days it will probably be more useful than it now is, but it is unfortunately more honored in the breach than in the observance. What boards of health need from the physicians is cooperation, not antagonism through compulsive measures, and so this law is in practice simply a "gun behind the door" which is rusty from disuse.

The country physician at this stage of public health history is usually a more influential local personage than is the health officer: and when the local "Dr. Smith" is brought before a county magistrate for not reporting the diphtheria of John Jones' child to some other physician living at the county seat, a very much irritated "Dr. Smith" goes scot free and little spontaneous help from him in disease control will the health officer receive thereafter.

Conclusion.—In that sweet day, for the advent of which health officers continually pray, when the general public will be so well informed as to the causes of infectious disease that it will not countenance inattention on the part of physicians to the preventive side of medicine, it may be that the physician law-breaker will be placed on all fours with other misdemeanants before the law. But even when that day arrives, my private judgment is that a greater degree of support to health measures will still be gained from the physician by making it plain to him that the facts and figures that he furnishes are not simply statistics in the eyes of the health officer but are being used by him for the good of the people, not only of the physician's neighborhood but of the larger public comprising the State and nation.

LETTER INTRODUCING THE SYSTEM OF REPORTS

Dear Doctor:

In order that measures may be taken to protect the community from the spread of communicable diseases, it is necessary that the health officer should learn promptly where such cases are occurring.

The system of monthly reports has not provided this information with sufficient promptness to be of the greatest service to the community. In some counties the physicians report each case immediately to the county health officer, but the clerical work is sometimes a hardship. To reduce this work, a system of weekly reporting is being adopted.

The county health officer of your county wishes to receive from you reports of cases of communicable disease occurring in your practice, and he agrees to be responsible for notifying the State Board of Health or any local board or department, as required by law. Therefore, we shall no longer send monthly report cards to you but shall expect to learn of your cases from his reports.

Each Saturday you will receive forms on which to report the cases which have been seen during that week. In order to assure privacy, these will be mailed by you to the county health officer enclosed in envelopes which will be supplied to you. It is requested that these reports be mailed as early as possible so that there may be no delay in starting control measures. It is also requested that you return the blank form, even though there are no new cases to report.

We are looking forward to better control of disease in your community through your help in this work.

Very truly yours,

.....

State Health Commissioner and
Collaborating Epidemiologist.

COPY OF ONE OF LETTERS SENT TO HANOVER COUNTY PHYSICIANS EVERY WEEK

(No County Health Officer in Hanover)

January 30, 1925.

Dear Doctor:

The following diseases were reported from Hanover County for the week ending January 24:

Influenza	180
Chicken pox	5
Scarlet fever	1

During the past weeks we have had two telegrams reporting the prevalence of smallpox in the State. As we know this is the season when smallpox is usually most prevalent, and as it has been reported in the State and from several cities in the South, it is well to be on the look out for this disease.

We have been called upon to investigate a condition which caused the deaths of several children in Loudoun County. These children ranged in age from one to four years. Illness began with vomiting, slight fever, followed by diarrhea, marked dehydration and symptoms of acidosis. The mortality rate has been very high among these cases. A definite diagnosis has not been made, but it is undoubtedly a gastro-intestinal infection, possibly influenzal in type.

Should you have any of these cases, we would appreciate it if you would report them promptly, as the mortality rate is so high.

Thanking you for your prompt reports, I am

Very truly yours,

.....

State Epidemiologist.

Dr. J. M. Jones,
Jonestown.

Dear Doctor:

You will be glad to know that an outbreak of diphtheria in.....neighborhood last week was controlled because of your promptness in reporting immediately the first cases coming to your attention. The throats of all contacts were cultured by me and several carriers found.

The following cases of communicable diseases were reported in ..... county the past week:

Disease	*Cases*	*Locality*
Diphtheria	2	Jonestown
Typhoid fever	1	Smith's Corner
Malaria	6	Swampville
Smallpox	2	Simkins

There will be a tuberculosis diagnosis clinic at the county seat next week. Bring any suspicious cases you may have for the expert opinion of a specialist.

Cordially yours,

.....

County Health Officer.

WEEKLY REPORT OF COMMUNICABLE DISEASES

NAME OF PHYSICIAN ..... WEEK ENDING 192

Please give full information in regard to cases of the following diseases:

Typhoid fever
Diphtheria
Smallpox
Scarlet fever
Diarrhea in infants under two years
Malaria
Dysentery
Intestinal parasites (name parasites)
Infantile paralysis
Cerebro-spinal meningitis

DISEASE	PATIENT'S NAME	RACE	SEX	AGE	LOCATION	COUNTY

State number of cases of the following diseases:

	COUNTY OR MUNICIPALITY				
Chickenpox					
Measles					
Whooping cough					
Influenza					
Pellagra					
Syphilis					
Gonorrhea					

United States Public Health Service
Assistant Collaborating Epidemiologist
VIRGINIA STATE BOARD OF HEALTH
Weekly Morbidity Report

Health Officer ..... Location .....

Week ending 192

Please give full information in regard to cases of the following diseases:-

Typhoid fever
Diphtheria
Smallpox
Scarlet fever
Malaria
Dysentery

Disease	Patient's name	Location	Race	Sex	Age	Physician

State number of cases of the following diseases reported during the week:-

Chicken pox
Measles
Whooping cough
Syphilis
Gonorrhea
Cerebro-spinal meningitis
Infantile paralysis
Diarrhea in infants under 2years
Influenza
Hookworm
Pellagra

Assistant Collaborating Epidemiologist

DISCUSSION (Abstract)

Dr. B. M. Primer, Austin, Tex.—Dr. Flannagan has very ably presented before you a subject that has been one of the most perplexing problems confronting the public health worker in the past, and continues to be a difficult one.

With the majority of his remarks I most heartily agree, especially in the need for a more efficient system of collecting reports of disease prevalence. The system of service to the local physician in return for a prompt and efficient reporting of disease, as introduced into Virginia by Dr. Riggin, and carried on in that State and also in South Carolina, is a commendable and highly desirable one. However, it presupposes a full-time health unit. In Texas, with its sparsely populated districts, this system could be applied only to a few counties. Therefore, I feel that we should try to work out other methods of getting these reports.

Information bureaus or systems of obtaining information regarding communicable diseases should be established in the public grade and high schools. Daily inspections, not examinations, by school teachers or public health nurses would help the local health officers in controlling outbreaks of disease in the very early stages. Hospitals should be under the supervision of the state boards of health and should make weekly reports of prevalence of communicable diseases. Educational work should be continued among the public concerning communicable disease records, and finally, but not less important, the same old attack on the physicians should be continued.

Dr. Flannagan has brought out very nicely the many misunderstandings that occur between the practicing physician and the public health worker. Many times it is the fault of the health officer. But we should put aside these personalities and consider the importance of the public trust placed in us. Great tact and willingness to withdraw from our views, etc., are necessary adjuncts of our profession.

In Texas the system of the part-time health officer and his troubles is our greatest problem. From my knowledge of the part-time health officer and his work, I feel sure that he is quite willing to do anything that the central office may ask of him. But a great number of them have not been truly "sold" on the idea of public health. Therefore, I have resolved to make as many personal visits on health officers as possible, and try to obtain a better cooperation in their work and our own. We need education of the public by all means, but first we should sell public health to the practicing physician.

Dr. K. F. Maxcy, U. S. P. H. S., Montgomery, Ala. Dr. Flannagan has asked a question, the answer to which has been sought by State and county health officers for many years, without, I think we may say, striking success. How can complete morbidity registration be obtained?

The old system was to furnish each practicing physician with a supply of report cards on which were printed a long list of the diseases which the law required reported and a long list of more or less relevant questions concerning the case. Realizing the incompleteness of the returns thus secured, Dr. Leathers, of Mississippi, was the first, I believe, of the Southern state health officers to introduce an innovation. Under the Mississippi system, although it is the same as regards the reporting of a few of the dangerous contagious diseases, this is supplemented by a periodic monthly check up of every physician in the State, requiring the reporting of the number, by race, of all the contagious diseases which he has attended. This system has achieved popularity among the physicians of Mississippi and an enviable degree of completeness.

In Alabama, when we contemplated a change in 1922, we considered adopting a similar system, but decided against it chiefly because of three main considerations: (1) The possibility of a large error where physicians are required to report diseases simply numerically; (2) the fact that the primary object of reporting contagious disease is the notification of the local health officer where and in whom the case occurred in order that an immediate follow-up may be initiated, if indicated; and (3) the month is too long an interval. A week is a much more desirable epidemiologic unit of time.

Because of these considerations, we instituted a weekly check-up of all the physicians in the State, requiring the reporting of all the communicable diseases in which health officers are directly interested, by name, race, sex, age and location. A simple type of report card was devised and a card mailed to every physician in the State once each week asking that they return the card, whether they had a case to report or not, in order that the completeness of the return might be estimated. This system improved reporting in Alabama very much, and has since been adopted with some modification in Oklahoma, Georgia and Tennessee. I cannot say, however, that we are yet entirely satisfied, and we are still trying to better the method.

It is obvious that no one method of collecting morbidity reports will fit all states, or even all the subdivisions, urban and rural, full-time and part-time health organizations, etc., of a single state. Certain fundamentals can, however, be agreed upon. The first is that the local health officer should know what he wants and why he wants it, and should make clear to the local profession that his demands are entirely reasonable and the material which he proposes to collect will serve a useful purpose. The second is that the system must make the least possible demand clerically upon the physician and must provide a periodic stimulation. There are probably other fundamentals upon which we can all agree. There is need for careful reconsideration of the whole subject of morbidity reporting. It seems to me that in the past we have been swayed too much by what may be theoretically desirable rather than what is practically necessary in the bookkeeping of public health effort.

Dr. D. J. Williams, Gulfport, Miss.—For a long time I have wondered why municipal, county and state health officers have persisted in making difficult the collecting of morbidity reports. The object of mor-

bidity reports is to obtain information of diseases in order to prevent its spread. There is nothing practical in having a physician report the presence of a disease to a state health officer, and then the state health officer forward the report to the county or municipal health officer. The necessary delay in the information reaching an active health officer whose duty it is to take early steps to prevent the spread of diseases where the report is sent in a circuitous route is useless. The morbidity report of the physicians should go direct to the county health officer, who acts immediately. These reports should be made by the physician to but one authority. No self-respecting thoughtful physician will continue to make multiple reports to the various departments. Where he knows the morbidity reports have to be forwarded by the state health officer to a county or municipal health officer whom it will reach too late to be of use in preventing the spread of diseases, he cannot become interested. Don't expect physicians to do what you would not do. Convince them that you will use the reports for the protection of the community, that you will act promptly. Then they will cooperate by making prompt reports. This has been demonstrated in Harrison County, Mississippi, where for ten years every physician in the county has made his reports direct to the county health officer. Obtaining reasonably accurate prompt reports is within the power of every county health officer, as a franking privilege is easily obtained as assistant collaborating epidemiologist. Each physician in the county at the end of each week is sent seven dated blank morbidity report cards, a card for each day. If you will use the information furnished on these cards, I can assure you the physicians will make prompt reports. Check the returned cards each day, and if one is missing, call the physicians over the phone and insist on the prompt return of all cards up to that date. If you don't get daily morbidity reports from all the physicians, the teachers and the heads of industrial plants, it is your fault.

Dr. J. J. Durrett, Memphis, Tenn.—Accurate bookkeeping is as important in a health department as it is in any business. The individual items comprising the general records must be exact and accurate.

If a health department, county or municipal is properly run, its work will be planned and executed along the lines that existing health conditions indicate. These conditions cannot be accurately determined without adequate information which can come only from statistics properly gathered and properly compiled. All sources of information should be developed and used, but proper values should be placed on the information derived from the various sources.

SURGERY

RAILWAY, INDUSTRIAL, GYNECOLOGICAL, OBSTETRICAL AND UROLOGICAL

A BRIEF SUMMARY OF BENIGN AND MALIGNANT LESIONS OF BONE*

By JOSEPH COLT BLOODGOOD, M.D.,
Baltimore, Md.

I have kept in touch with my own bone material and the literature since 1893. In the December numbers of Progressive Medicine from 1899 to 1918, I reviewed the literature and incidentally from year to year have reviewed my own personal experience.

In 1903, I found that we had but 43 cases of bone tumors, and these I reviewed in pamphlet form for students. In 1920 I found that there had accumulated in the Surgical Pathological Laboratory of the Johns Hopkins Hospital almost 400 cases, and on these I made a report in the *Journal of Radiology* for March, 1920, and added numerous illustrations. I now find practically 1000 cases for restudy. From all of these benign and malignant bone lesions the common tuberculosis and pyogenic osteomyelitis have been excluded. Only those cases of tuberculosis and osteomyelitis have been included in this study, which, in their clinical and x-ray picture, suggested some type of neoplastic lesion of the shaft or epiphysis.

The lesions of bone which predominate in numbers are the benign bone cysts (lesions of the shaft in children), the benign giant-cell tumors (involving the epiphysis of adults), and sarcomas. The total number of sarcomas, in my lists is a little larger than the number of bone cysts and giant-cell tumors combined.

As no one individual, or even the ordinary surgical clinic, has an opportunity to see many examples of bone tumors, I am inclined to think it will be most helpful to summarize again the salient features in the diagnosis and treatment and leave to previous and future articles the more detailed discussion of the rarer types.

Central Bone Lesions.—Now that the people are educated to expect an x-ray if there is trouble in a bone or joint, and have been influenced to seek advice quickly after the first symptom of pain or swelling, the x-ray pictures the central lesion with an intact bone shell when palpation finds no evidence of any infiltration outside the shell. If the patient is under fifteen years of age, and the central tumor is in the shaft, one may be quite certain that it is a bone cyst. If, on the other hand, the patient is an adult the tumor is more likely to be a chondroma or a metastatic tumor. When the epiphysis is involved, it is usually a giant-cell tumor. If the patient is an adult one must bear in mind the rarer chondroma, myxoma, metastatic tumor, a multiple myeloma. I am discussing single tumors now. The myeloma is very unusual in children. It usually attacks the diaphysis and for some time may apparently be a single lesion. Wherever there is a possibility of a chondroma, there is also a possibility of a myxoma, or the sarcoma arising in chondroma or myxoma. Age, therefore, divides central tumors into benign and malignant: under fifteen they are more apt to be benign; over eighteen benign and malignant; between fifteen and eighteen, rarely malignant. In the adult with involvement of the shaft chondroma and metastatic tumors predominate, while, if the epiphysis is the seat of trouble, the giant-cell tumor must be always considered first.

Let us repeat, the more common central lesions of bone all of which for a time are confined within the bone shell are the benign bone cyst (ostitis fibrosa), the giant-cell tumor, the chondroma, the myxoma, the sarcoma developing in chondroma or myxoma, the metastatic tumor, and multiple myeloma. The rarer central lesions are the Brodie abscess in the epiphysis or shaft. I have just observed one in the middle third of the shaft of the tibia in a child. The x-ray picture was very little different from that of a bone cyst. Tuberculosis as a single caseous area or abscess in the shaft or epiphysis may be a single lesion with an intact bone shell and impossible to differentiate, except at exploration. The history of perforation and sinus communicating with the central lesion in the shaft or epiphysis, suggests tuberculosis.

As yet I have no example of a central chon-

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., Nov. 9-12, 1925.

dro- or myosarcoma which has remained well five years after resection or amputation, nor do I know of an authentic case in the literature or among those registered by Codman of Boston.

Therefore, in central bone lesions with an intact bone shell, amputation should not be resorted to without exploring the contents of the bone shell, and even if the frozen section indicates sarcoma, it would appear from recent observations that curetting with the actual cautery offers as much as amputation. If the bone shell is destroyed and the lesion is malignant, there should be resection or amputation for sarcoma.

Pathological Fracture in Central Bone Lesions.—I have just reviewed about 128 cases of pathological fractures among about 1000 cases of bone tumors. It is most common in central tumors and when they are situated in the shaft. They occur more frequently in the bone cyst than in any other type of central lesion.

Treatment of Central Bone Lesions.—If the bone shell is intact in the x-ray, subsequent x-rays will picture very clearly whether there is further expansion, thinning or perforation of the bone shell, or any ossification of the clear shadow within the bone shell. If there is a pathological fracture, the fracture may heal in any type of lesion, but only in the bone cyst will there be complete ossification. I have seen this in the chondroma, the giant-cell tumor, the myeloma and the metastatic tumors. When after the first x-ray a subsequent x-ray shows further expansion of the bone shell, thinning, perforation or involvement of the shaft above and below the original lesion, immediate operation is indicated, unless the lesion is multiple.

If the patient is under fifteen and the shaft is involved and when there is a fracture, the x-ray will probably show not only healing, but rapid ossification. If it does not, operate, as nothing is gained by delay. If there is no fracture, operation is indicated unless there is evidence of ossification within a few weeks. When you operate upon a bone cyst, first explore and be certain from your studies of the gross and microscopic appearances that it is a bone cyst. If it is, remove the fluid and connective tissue lining, or the solid mass, and then produce a fracture. In large cysts crush the shell; if there is a large cavity fill it with bone chips. If you have any doubt as to the nature of the lesion, leave the bone shell intact, except for the exploratory opening, and thoroughly burn out with the cautery; then if there is a large cavity and no hemorrhage, fill it with bone chips or a transplant; or, if there is much hemorrhage, pack with gauze, close the skin over the gauze, keep the wound sterile, remove the gauze in three to five days and transplant. If the cavity is small, bone transplantation is unnecessary, although, in some cases, temporary gauze packing may be necessary.

Remember, when you explore a central bone lesion with an intact bone shell that the fibrous tissue (ostitis fibrosa) of the bone cyst is inflammatory, and no radical operation is indicated. We know that bone cysts heal spontaneously. We have ample evidence that an accidental simple fracture will be rapidly followed by ossification. If the tumor is of the giant-cell type, this tissue is so like a neoplasm in its ability to reform if any is left behind, that it must be thoroughly curetted and then the cavity subjected to chemical or thermal cauterization. I have employed 50 per cent solution of zinc chlorid and pure carbolic followed by alcohol, the electric or plumber's cautery. This charred bone gives no more trouble than a bone transplant if the wound is aseptic and closed. From my studies of more than 200 cases the recurrences after the curetting of giant-cell tumors may be explained more easily by faulty technic, than by any difference in the virulence of the giant-cell tumor. The evidence in the past few years also indicates that the introduction of radium into the bone cavity after curetting is dangerous. It has produced much necrotic tissue, and there has been infection. I have collected six amputations after such treatment and one which we may call near-amputation, in which the lower end of the radius was so destroyed by osteomyelitis that there was a marked deformity of the hand.

In chondroma the greatest danger is the transplantation of a bit of cartilage into the soft-part wound, where it will later grow and produce a new chondroma. I have always used the electric cautery in removing a chondroma, and so have no recurrences. The most dangerous central tumor which is perhaps curable if eradicated, is the myxoma. When one explores a central tumor of the shaft or epiphysis in an adult, one should always be prepared for the myxoma, and a plumber's soldering iron is the best instrument of attack. I have already reported in the *Annals of Surgery* that every myxoma cut into and removed piece-meal has ultimately recurred and the patient died of metastasis. Dr. Rockey of Portland, Oregon, more

than one year ago explored a central tumor of the lower end of the femur, recognized its myxomatous nature, attacked it with the plumber's soldering iron, closed the wound without drainage or packing, and this patient is apparently well today. It is the only case attacked in this way, and the only one living without amputation. At about the same time I diagnosed a myxoma of the lower end of the femur because of the destruction of the bone shell, the intense local pain and tenderness and the fact that there was no relief from deep x-ray treatment. The amputation was performed, because the bone shell was partly destroyed. There was no exploration. This patient is apparently well today.

The myeloma and the metastatic tumor may, on account of hemorrhage on one hand, suggest a giant-cell tumor, while the myeloma without hemorrhage might be considered a myxoma. The frozen section will differentiate the lesion at once. The myeloma and the metastatic central tumor may be attacked, just as the giant-cell tumor and myxoma, with the cautery. I have an example of a myeloma which healed after such treatment, but later multiple tumors developed. In metastatic tumor of the shaft of the femur the patient was able to walk on the limb for almost two years before recurrence and fracture took place. In the myeloma and in the metastatic tumor cures cannot be accomplished, but much may be done by cauterization or, what I would prefer, resection and transplantation. Amputation is the last resort in a late stage. The Brodie abscess is a very rare condition, and all one has to do in some cases is to drain the abscess, but in other cases the bone shell may be so diffusely involved in the pyogenic process that a subperiosteal resection is the best resort. If the abscess involves the shaft, this can be easily done, but if it involves the epiphysis, it should not be the first operation, because this would involve the joint and interfere with function.

These simple rules of age, of situation in the shaft or epiphysis, must be remembered in the differential diagnosis of central lesions. When the bone shell is intact there is nothing characteristic in the x-ray. Changes in the bone shell, perforation, partial or complete destruction, periosteal bone formation, and ossification of the shadow within the bone shell are later changes and suggest differentiation. Changes in the marrow cavity above and below the central lesion also have their diagnostic value. In this short paper it would take too much space to go into details.

When the lesion is single there is no objection to trying x-ray treatment first, but if the patient is older than eighteen and the shaft is involved, I would prefer exploration. Even in those cases in which the epiphysis is involved and the chances of a giant-cell tumor are large, my own experience favors operation and curetting rather than trying x-rays first.* If you are so fortunate as to see a central bone tumor with an intact bone shell without fracture, not much is gained by waiting for further expansion and destruction of the shell. If there is a fracture, it seems safer, in adults, to give deep x-ray treatment and observe whether healing takes place. This advice is based upon theory. I have tried it only in the giant-cell tumor.

None of the numerous giant-cell tumors which have received radium or x-rays before they came under my observation, or in which I have employed radiation, have shown any evidence of ossification of the tissue within the bone shell, although some authorities report such changes. I have observed ossification of the central shadow only in ostitis fibrosa, whether x-rays were given or not. Periosteal bone formation I have never observed in the giant-cell tumor. It is present in the bone cyst only at the site of fracture. It is quite common in the central chondroma.

Before leaving this group I wish to warn again of the increasing number of quiescent, partially or completely ossified bone cysts revealed in an x-ray examination after recent injury in both children and adults. The most characteristic feature is the partial or complete ossification.

Periosteal Bone Lesions.—What shall the terminology be for those lesions of bone which, in the x-ray, are entirely different from the cen-

*Since this was written in November, 1925, five months ago, I have had an opportunity to observe the effect of x-ray radiation on central tumors of epiphysis with the x-ray picture of the giant-cell tumor. In one the diagnosis was confirmed by biopsy. These cases show that under radiation the bone shell increases in thickness, and there is every evidence that there is ossification within the bone shell. In one instance, after x-ray treatment, a portion of the bone shell apparently completely destroyed showed distinct evidence of complete restoration. But in none of these cases have I so far been able to observe the complete ossification so clearly and frequently seen in a bone cyst. There is, therefore, no objection to trying radiation with x-rays or radium and to continuing it if the bone shell shows no further expansion and becomes thicker and when function is restored. I have no evidence yet that x-ray treatment will ultimately replace curetting in the giant-cell tumor.

tral lesions? They are known in the literature as syphilitic periostitis, usually associated with ossification and often with some destruction of the shaft. Pyogenic osteomyelitis is a distinctly diffuse lesion of the bone, the x-ray picture of which varies with the stage of the disease. Then there is the sclerosing, non-suppurative, chronic osteomyelitis which is a diffuse lesion of bone, marrow, cancellous, cortical, periosteal. Tuberculosis now and then may be a diffuse osteomyelitis, and other rare types of organisms may produce a diffuse osteomyelitis.* There is a definite ossifying periostitis in which the cortical bone and marrow seem uninvolved. Its etiological factors are trauma, infection (syphilitic and pyogenic) and neoplasms. The large group known under the term of exostosis may be congenital or acquired, single or multiple. Last is the great group of sarcomas.

Sarcoma as a distinct central lesion in its onset is very rare, even the sarcoma secondary to chondroma or myxoma. The common sarcoma of bone is a diffuse lesion of marrow and shaft, usually very quickly after the onset associated with a definite periosteal tumor. Although the registrar of Codman attempted a classification of bone tumors and achieved great improvement in a systematic scheme, I am attempting here a classification of the picture which is to be made before we know the gross and histological appearance.

Sarcoma of Bone.—Let us first take sarcoma, and I will attempt to describe briefly the varying x-ray pictures which I have seen, most of which have been reproduced in the *Journal of Radiology* for March, 1920.

The most distinctive is the sclerosing sarcoma described by Ewing and accepted by Codman for the registry classification. The lesion seems to involve the shaft first, as a rule near the epiphysis, and the latter is very quickly involved. Even in the earliest x-rays there is an irregular cloud over the shaft of the bone, cortical, cancellous, marrow, and in all of my cases a distinctly visible, soft-part shadow in the periosteal zone. In my studies no other disease of bone has ever produced such an x-ray picture. To one who is familiar with it, it is pathognomonic. At this time there is no bone destruction. Later we may see destruction of the cortical layer, and later evidence of bone formation in the periosteal shadow. But one needs neither the periosteal bone formation, nor the cortical bone destruction to make a diagnosis. This dense, cloudy shadow is due to the dense fibrous tissue excited by the infiltrating malignant cells. It corresponds to the scirrhous carcinoma. Along with this new formation of fibrous tissue there may be new bone formation, both, in the shaft and periosteum. When you explore such a sclerosing sarcoma, you may get a bit of the periosteal tumor with the knife, but it takes a chisel to dig out a piece from the shaft. Sclerosing sarcoma, with and without an ossifying periosteal tumor, is a distinct type.

Osteoporosis Sarcoma.—As far as I know this is the beginning of the destructive type of sarcoma. Its location is not different from the sclerosing. The onset is usually in the shaft near the epiphysis with rapid involvement of the latter. Where in sclerosing sarcoma there is an irregular cloud, here there is an area of more porous bone, practically identical with the osteoporosis of non-use. As in sclerosing, so in osteoporosis sarcoma we can see in the x-ray a thin, faint periosteal shadow. Now and then in the osteoporosis type bone formation in the periosteal tumor may take place, but I have never observed it in the shaft area. Very quickly areas of bone destruction appear, and the periosteal shadow grows rapidly larger. In the early years we saw only the destructive stage. Now the osteoporosis of the early stage is frequently seen.†

*Paget's disease may involve a single bone. It is a diffuse process of the shaft, not unlike sclerosing sarcoma or osteomyelitis. But it usually involves the whole shaft from epiphysis to epiphysis and is associated with bending and bowing. Remember, sarcoma at any moment may begin in the Paget bone. The symptoms are pain and swelling, and the x-ray shows distinct osteoporosis. In the majority of instances the condition is not recognized until metastasis has taken place. Paget's disease apparently is some form of chronic inflammation. It is called osteitis deformans. It is observed in the adult, while osteitis fibrosa is a disease of the bone before ossification of the epiphysis. The different types of osteomyelitis attack the shaft at any age.

†Since writing the above in November, 1925, I have observed an example of osteoporosis sarcoma at the junction of the middle and lower thirds of the femur in a girl of 19, in which for the first time pathological fracture was the symptom of onset. When we looked at the x-ray only and saw a porous shaft above and below the fracture, there was no way of distinguishing sarcoma, metastatic tumor, Brodie's abscess, and a rare type of bone cyst. The same week in a patient over 30, old for a bone cyst, there was an x-ray of the femur in the same position. Yet, when explored, the lesion proved to be ostitis fibrosa.

The educational campaign is accomplishing remarkable results. All diseases are coming under observation at such earlier periods that it is difficult to keep pace and develop methods of diagnosis and treatment to meet the rapidly changing clinical and x-ray picture.

Excessively Ossifying Sarcoma.—I am inclined to think this is a late stage of the sclerosing sarcoma, but in some cases the periosteal ossifying zone predominates in the picture and obscures or obliterates the shaft shadow. Many cases of this type of sarcoma are impossible to differentiate in the x-ray from an ossifying periostitis of benign origin, or an ossifying myostitis extending and surrounding bone.

Destructive Sarcoma.—This, I feel quite sure, is the late stage of the osteoporosis type. In its late stages it is just as pathognomonic of malignancy as sclerosing sarcoma. But when there is only slight destruction of cortical and cancellous bone with some ossification of the periosteal tumor, it is difficult to differentiate it from the diffuse osteomyelitis of syphilitic or pyogenic origin, especially the sclerosing, nonsuppurative kind.

Periosteal Sarcoma.—I have been one of those who have constantly employed this term, although I knew that the shaft was involved as well as the periosteum. But it was essential to have some term to distinguish the sarcomas that were not central. In my first studies periosteal sarcoma always involved the shaft with the periosteal growth. A primary central chondroma becoming sarcoma with destruction of the bone shell and the formation of a periosteal tumor would practically be identical with the periosteal sarcoma. In former days practically all sarcomas of bone belonged to this group. As education brought us earlier cases and as our experience in some clinics grew rapidly larger, we began to see more clearly. Sclerosing, excessively ossifying, osteoporosis and destructive sarcoma began to differentiate themselves. All could be placed in one group with the term diffuse sarcoma of bone. In the days of late tumors all recognized a definite periosteal tumor which rested on an apparently uninvolved shaft. Later the cortical bone was destroyed by infiltration or pressure. As some of these tumors contain much fibrous tissue, the term periosteal fibrosarcoma crept into the literature and has been accepted by the registry. In my article in the *Journal of Radiology* for March, 1920, I picture an x-ray of the femur in which the cortical bone is normal, yet there are mottled areas of destruction in the marrow. Danforth of Providence, who sent the x-ray to me, said he could palpate a periosteal mass. Later a pathological fracture and amputation gave us an opportunity to study the specimen. Here we had a periosteal sarcoma not of the fibrosarcoma type, but very cellular, of the osteogenic type which infiltrated into the marrow through the Haversian canals without producing sufficient bone destruction to show in the x-ray. So there is a periosteal sarcoma resting on the shaft replacing the periosteum in which the x-ray shows no bone changes. In another case the cortical bone is intact, but there is evidence of marrow infiltration with destruction. But the newer type of periosteal sarcoma has been only recently observed in my cases. They are all very early observations. The diagnosis in all has been confirmed at operation. There is first a palpable periosteal mass, the size of a thumb or smaller, resting on the shaft, not encircling the shaft. In one group the x-rays show the cortical bone beneath this periosteal tumor intact. In others the bone formation is very excessive. But in both we see an unchanged cortical, cancellous and marrow shadow. Operation and microscopic study have shown the shaft to be still uninvolved. These are rare tumors.

Then, in the next type, the cortical bone beneath the periosteal shadow shows osteoporosis or destructive areas, and the worm-eaten appearance may extend through to the cancellous bone. I have seen identical pictures in infectious periostitis which I have reported. All my cases of infectious periostitis were multiple, while sarcoma is always a single lesion.

My recent experience confirms my classification of 1920, extends it with these new cases of periosteal sarcoma, and makes this regrouping possible.

To repeat, therefore, we can recognize in the x-ray as a diffuse lesion of bone sclerosing, excessively ossifying, osteoporosis and destructive sarcoma. And then we can recognize the different types of periosteal sarcoma with or without involvement of the shaft beneath.

We may speak of these as diffuse and periosteal neoplastic lesions of bone, and they must be differentiated in the x-ray, if possible, from periosteal and diffuse lesions of bone of traumatic and infectious origin, because their treatment is radically different as well as the results.

Microscopic Sarcoma.—Codman's committee in their classification, recognizes osteogenic fibrosarcoma, telangiectatic (angio-sarcoma) and Ewing's endothelioma. The giant-cell tumor is rarely periosteal. Except as an epulis, I have not seen an example in the past twenty years. As a rule the sclerosing and excessively ossify-

ing sarcomas are osteogenic, the osteoporosis and destructive sarcomas telangiectatic or endothelial. But the x-ray classification by no means corresponds with the microscopic. The same cellular type of neoplasm may show different x-ray pictures due to the presence or absence of new bone formation. Up to the present time all sclerosing sarcomas have been osteogenic.

Benign Periosteal Lesions.—These are various forms of exostoses, congenital and acquired, localized traumatic periostitis or myositis, and chondroma, which may be associated with bone (osteochondroma).

The characteristic feature of the localized ossifying periosteal tumor is the normal cortical bone beneath the new bone formation in the single and multiple typical exostosis. The picture is absolutely distinct from any observed sarcoma. But when the localized bone formation is due to trauma, the x-ray shadow is sometimes difficult to differentiate from an early periosteal sarcoma. The bone formation in ossifying periostitis of infectious origin—syphilitic, pyogenic and, rarely, tuberculous—never produces a picture like exostosis, but cannot always be distinguished from the traumatic ossifying periostitis. As a rule in the infectious ossifying periostitis there is some cortical destruction and the marrow shadow may not be distinct. This picture is difficult to separate from sarcoma. In the majority of instances these benign bone forming periosteal lesions can be distinguished by palpation from sarcoma, but in a few instances only exploration and biopsy will differentiate them. In some of these, even with the microscope, it requires great experience to recognize the sarcoma from the benign growth.

The chondroma is a palpable tumor resting upon a fairly normal cortex. The cartilage throws but a faint shadow. Its base may have a collar bone around it. Bone may be mixed with cartilage and show in the x-ray. It is very important to record here that the periosteal myxoma may throw the same shadow in the x-ray as the chondroma, but the myxomatous tissue is rarely associated with bone formation, while the chondroma often is.

Among 110 osteomas, largely of the exostosis type, there was but one in which myxoma was present in the ossifying mass. In this case the lesion in the popliteal space attached to the lower end of the femur was removed piecemeal. There was local recurrence and death from metastasis, the only one among these 110 exhibiting the clinical course of malignancy. As I shall frequently repeat, it is of the utmost importance, when tumors of bone are explored, either periosteal, diffuse or central, to have ready both the soldering iron and the electric cautery. This thermocauterization, I believe, is essential for the myxoma and it may prevent local recurrence which so frequently happens when chondromas are removed and little pieces left behind for transplants. My experience teaches me that it is a very satisfactory way of curetting the giant-cell tumor and it may be sufficient for some central and periosteal myxomas or myxochondrosarcomas.

The order of frequency of periosteal tumors of these types is: osteoma, including exostosis and ossifying periostitis; chondroma, or osteochondroma, and myxoma. Osteomyxoma is very rare. The registrar would call these benign osteogenic tumors.

Osteomyelitis.—Osteomyelitis is a benign diffuse lesion of bone which differs from sclerosing or osteoporosis sarcoma in the presence of inflammatory instead of neoplastic cells. The causative agent of the osteomyelitis is a demonstrable organism. That of sarcoma is yet unknown. With osteomyelitis there may be pus and sequestrum, with sarcoma never, until there is a definite infection, when the two processes are present together. This latter is rare. I have never been convinced that sarcoma develops in a previous acute or chronic osteomyelitis, but in a few instances the osteomyelitis may be secondary. This incident confuses clinical and x-ray pictures, which were already difficult to interpret. All of the cases in this group have died quickly of metastasis. It is a group that needs further investigation and this cannot be done until we have more carefully studied cases.

Acute Osteomyelitis.—Now and then sarcoma begins with intense pain, rapid swelling and fever, like acute pyogenic osteomyelitis, but so far in my experience, there has been an absence of leucocytosis, or an increase in the per cent of polymorphous neutrophiles.

But in sarcoma the expected abscess does not develop, while, with rare exceptions, in acute osteomyelitis it does. Long before we knew much of sarcoma of bone, the clinical picture of acute osteomyelitis was well recognized. In my experience, acute osteomyelitis is on the decline. Better living conditions, better care of tonsils, adenoids and teeth, are cleaning up the foci of infection. But I have just seen in the surgical clinic of Professor Starr of the Uni-

versity of Toronto, a young boy with a diffuse lesion of the lower end of the femur. It began clinically like acute osteomyelitis, but pus had not formed at the end of four months.*

Chronic Osteomyelitis.—The majority of cases of chronic osteomyelitis come into the surgical clinic with one or more sinuses and a history of an acute attack. Now-a-days this group is getting less frequent, while the chronic bone abscess described by Brodie and the sclerosing non-suppurative osteomyelitis of Garre is on the increase. It is my opinion that many of these cases spontaneously recover before x-rays are taken, and many are walking around with thickened bones or a partially healed bone abscess without symptoms. But the enlightened public today comes under observation very quickly, and the roentgenogram is discovering many latent bone lesions and others the onset of which is so insidious that in former days they were overlooked. It is important to note here that Brodie's abscess may be in the shaft as well as in the epiphysis, that the sclerosing osteomyelitis is a disease of the shaft and has been observed at any age. There may be a spindle-shaped, palpable mass, and an x-ray picture like sarcoma.

Tuberculosis.—With the rarest exceptions tuberculosis distinguishes itself by early joint symptoms, by attacking the epiphysis and by multiple lesions in the x-ray. But now and then tuberculosis gives the picture of a Brodie abscess in the shaft and, especially in the phalanges, metacarpal and metatarsal bones, it may be associated with the clinical and x-ray picture difficult to distinguish from syphilitic and pyogenic osteomyelitis and from sarcoma. The greatest aid here is that the small pipe bones are rarely the seat of sarcoma.

Syphilitic Periostitis and Osteomyelitis.—In recent years the Wassermann test and the rapid improvement after intravenous therapy makes the diagnosis. Without these it would be very difficult and, in some cases, impossible, to rule out sarcoma.

Multiple Periosteal Lesions.—Primary periosteal or diffuse sarcoma is never multiple. But the different types of osteomyelitis may be. Traumatic periostitis may be multiple. Metastatic tumors, except in the skull never suggest a periosteal lesion. In the skull they often cannot be distinguished. For this reason the skull must be studied as a chapter by itself.

Exostosis is the most common multiple lesion. As a rule there is a history establishing it as congenital and hereditary, and the x-ray pictures are quite typical. There is a disease called multiple exostosis incorrectly, because there are not only exostoses, but changes in the epiphyses, in the ends of bones, enlargement of the ends of bones, with atrophy of the epiphysis in other bones. When the shaft is involved it is not the picture of a bone cyst. There may be bowing. It is usually congenital, but not with a history of heredity as in exostosis. It may involve the skeleton unilaterally. It impresses one as a disease of development. It requires further study. The disease is distinctly benign.

Multiple Central Lesions.—The most common are metastatic, usually from carcinoma. At present the breast and hypernephroma predominate. Cancer of the thyroid is a rarer tumor than hypernephroma. I have an example of metastasis from a pigmented mole. A few sarcomas of bone have been multiple, suggesting metastasis. Ewing's endothelioma with its picture of osteoporosis may be multiple, but the x-ray distinguishes it from central tumors. Multiple myeloma ranks next. Multiple cysts are comparatively rare. Multiple giant-cell tumors are very rare. Diseases of the skeleton with both cysts and giant-cell tumors or diffuse osteitis fibrosa as described by Rehn, and occur about

*Dr. Starr had given a clinic on this case with the conclusion that it was osteomyelitis. A few days later I gave a clinic on the same patient with the conclusion that, although clinically the picture suggested osteomyelitis, the x-ray favored sarcoma. Dr. Starr writes me that at exploration there was definite evidence of osteomyelitis, pus and sequestrum. As my experience grows and more cases of sclerosing and other types of osteomyelitis come under observation, and the different types of sarcoma in the earliest stages, I am finding greater difficulty in making an exact differential diagnosis. Therefore, we must have a working rule. If the lesion is below the middle third of the femur, amputation offers most for sarcoma. One should explore with the consent to amputate, if it is sarcoma, and be prepared for frozen sections with the polychrome methylen blue stain. Cover slips showing bacteria, pus and sequestra indicate osteomyelitis. But in sclerosing osteomyelitis there is neither organism, nor pus, nor sequestrum, and the microscopic differentiation is difficult.

When the lesion is above the middle third of the femur, or on the upper extremity, amputation has never accomplished a cure. Therefore, radiation should be the method of treatment. It offers most for sarcoma and does the osteomyelitis no harm. If the lesion is of a bone of the upper extremity and so localized that resection is possible, I am now exploring and resecting if the frozen section shows sarcoma. This year there have been three such cases, and one two years ago, all in the earliest stages of sarcoma. All are apparently well today with good function.

once in twenty-five years in the largest collections. But it is very important to remember that any of the multiple lesions may come under observation as a single bone lesion, and the x-ray of the skeleton will at first find no others. Bence-Jones bodies in the urine, in my experience, indicate a hopeless bone lesion, usually multiple myeloma.

This is but a brief review based upon about 1,000 cases which have been studied and restudied for more than twenty-five years. It is possible, in any clinic, for a case of this kind to be studied, but it is difficult in every clinic to come to a correct diagnosis in many cases.

There is still a difference of opinion as to whether the central giant-cell tumor is ever malignant or associated with metastasis. X-rays of the different types of bone lesions submitted to the most experienced diagnosticians usually reveal different diagnoses, and sections from the same group of cases examined by an experienced group of surgical pathologists, show differences of opinion as to malignancy.

Codman's bone registry, more than any other contribution of the past few years, has brought these facts to light and broadcast this information. There is every evidence that the distribution of cases registered with Codman for study by many men in different clinics has been a very helpful educational effort and Codman deserves great credit not only for the conception of his unique plan, but for the thorough and efficient execution of it.*

**Conclusions* (April, 1926).—This paper was written in November, 1925, and the four footnotes just added record new material with new deductions. In the Johns Hopkins Clinic up to 1913 there was not an example of any type of sarcoma which had remained well five years or more after amputation, and which would have been accepted by Codman's registry. When I made my report in 1920 in the *Journal of Radiology* I recorded two five-year cures, both of which have been accepted by the registry. These operations took place in 1913. Since 1920 to 1926 a number of new cases have reached the five-year limit without recurrence after amputation. The number is increasingly large, making the per cent of cures so much greater that there is only one explanation for the result, earlier amputation. All of these cured patients have had lesions below the middle third of the femur. In addition, one sarcoma of the humerus treated with radium (Dr. Burnam, of the Kelly Clinic in Baltimore) has reached the five-year limit. In this case the x-ray shows a picture which must be looked upon as sarcoma, and I think that this diagnosis would be accepted by the majority of the registry committee. But the report is not yet in.

To repeat, the greatest increase in the number of cases is in certain types: healed bone cysts, latent lesions; Paget's disease of the skeleton; sclerosing, nonsuppurating osteomyelitis as single lesions; a form of destructive osteomyelitis, often multiple, very difficult to differentiate from sarcoma when single; and multiple exostoses. Syphilitic bone lesions are decreasing. Sarcoma is distinctly on the increase. It is my opinion that many of these patients formerly died at home without record. Now practically all reach some clinic and x-rays are taken, and many individuals see these x-rays. There has been a tremendous improvement in our diagnostic ability. The number of amputations for giant-cell tumor has decreased far beyond expectation. Very seldom is a leg amputated unnecessarily. Radiation is being given a fair trial. The dangerous biopsy is becoming less frequent. Remember, if you want help, send the x-ray. Do not do a biopsy and send the sections. Practically all of us need more experience and training in the frozen-section diagnosis of bone lesions. It is dangerous to wait for the case in which this diagnostic method is essential. Let your team practice daily in the operating room with the frozen section and the polychrome methylen blue stain.

DISCUSSION (Abstract)

Dr. M. S. Henderson, Rochester, Minn.—Dr. Bloodgood kindly wrote me and suggested that in opening this discussion I bring out certain points in the diagnosis of osteomyelitis, chronic sclerosing osteitis, syphilis of the bone, and sarcoma.

In osteomyelitis the history is a great aid in making a diagnosis. The x-ray findings depend largely upon the stage of the disease, the destruction involving the entire shaft in some cases.

In syphilitic cases there are no characteristic x-ray findings. Quite often when syphilis occurs in the region of a joint it involves but one bone and the joint is not greatly affected. The history is important and the Wassermann reaction is generally positive.

Chronic sclerosing osteitis is characterized by a localized dense area with some hypertrophy, is usually in the tibia, and the medullary cavity is obliterated.

We have numerous cases which illustrate Dr. Bloodgood's contention that amputation is rarely justifiable. The more acute and short the duration of symptoms, the more malignant the tumor.

Dr. F. Walter Carruthers, Little Rock, Ark.—The question of diagnosis and eventually treatment of neoplastic lesions of bones, particularly sarcoma, is based on a few fundamental facts, which are very frequently entirely diagnostic. The differential diagnosis of multiple bone lesions on superficial examination presents a mass of heterologous findings which suggest confusion, but on further study this mass of data can be summarized in a few essential facts. The essayist has formulated three very essential facts, while Ewing, of New York, has added two additional points which we find extremely useful. Multiple central lesions are not sarcomatous but are rather acute hemorrhagic osteomyelitis, bone aneurysm, bone cysts, infectious osteoporosis, tuberculosis, syphilis and metastatic carcinoma. Again we find that multiple periosteal lesions are not frequently associated with multiple congenital bony defects.

Multiple myeloma is a specific malignant tumor, arising from a single cell in the blood sinuses. It is very progressive in nature and shows extensive invasion in the bone marrow with pronounced lesions in other organs and a certain fatal termination. As to the etiology, little can be said except that it is a disease of

middle life, chiefly in males. The fact that it is infectious in origin has frequently been suggested and substantiated by well known authorities.

The frequency of metastasis of mammary carcinoma is well known. It is also well known that osseous carcinoma is never primary but is metastatic. In case of bone there exists a considerable variety of opinion as to whether general osseous invasion is common or the reverse. This uncertainty is probably due to the fact that autopsies on cancer patients are not always complete in connection with the osseous system. Handley expresses the view that, in mammary cancer, secondary bone deposits occur only in bones which lie wholly in the area liable to subcutaneous nodules. The lack of definite symptoms in the presence of carcinoma in bones has been very forcibly emphasized on many occasions. Neither local tenderness nor other manifestations direct our attention to it unless by chance the occurrence of a fracture turns our notice to the osseous system. The regenerative power apparently possessed by bone at the seat of the carcinoma probably accounts for the further lack of definite symptoms. This, I think, clearly indicates the need of a more systematic use of skiagraphy in all cases of carcinoma.

APOPHYSITIS OF THE OS CALCIS*

By JOHN T. O'FERRALL, M.D.,
New Orleans, La.

Since the description of Osgood-Schlatter's disease and Legg-Perthe's disease, an increasing interest has developed in epiphyseal disturbances and certainly a richer clinical knowledge of them has been gained. The cause of these epiphyseal changes remains unsolved, although it is certain in my mind, that mechanical influences, such as strong tendon or muscle pull, and weight bearing thrusts, especially in such joints as the hip, play a major part. Infection may play a part but insufficient proof has yet been brought out except in isolated cases. Recently our attention has been called to the condition of painful vertebral epiphyses and to apophysitis of the os calcis. The latter condition I wish to discuss at this time.

While the literature contains exceedingly rare references to this subject, it is known that all epiphyseal disturbances occur in the period of greatest growth activity of a child, namely, between the ages of 6 and 17. The children are usually in the best of general health and very robust in type. The history of the disability does not reveal the occurrence of any definite injury. The onset of symptoms is insidious and is generally attributed by the patient to pressure from the counter of the shoe or a seam in the stocking. The posterior aspect of the heel becomes somewhat red and slightly swollen, but markedly tender. Contraction of the Achilles tendon, dorsal flexion of the foot against resistance and walking in the bare feet greatly increases the pain at the site of the attachment of the Achilles tendon to the os calcis. The condition has existed for several weeks, as a rule, before the patient is seen for treatment.

The x-ray reveals the typical flattening or thinning of the epiphysis with disintegration and absorption of parts of it. These areas of decalcification are typical and, of course, can best be illustrated by comparison with the opposite epiphysis.

As a rule the disturbance is unilateral. This, at least, is apparent in the two cases reported by Allison, and is true in the two cases to be reported at this time.

The treatment of these cases has proven very simple and the results obtained are permanent. It has been my custom to fix the extremity in plaster from toes to knee and reduce weight bearing to the minimum. Within six to eight weeks of such fixation, all symptoms have disappeared and no recurrence has taken place.

The x-ray reveals, after fixation, that the affected epiphysis has begun to assume its normal thickness and the areas of absorption and disintegration have begun to disappear. In short, decalcification has ceased and recalcification has begun.

As far as I have been able to find in the literature, the accompanying x-rays are the first published showing the effects of treatment in these cases and the actual changes in the epiphyses brought about by such treatment.

Case 1.—T. D., white boy, 11 years old, applied for treatment in March, 1924. He had been an unusually healthy child except for chronic constipation. He had had no infectious diseases except measles and chicken pox in 1920. In 1919, a severe attack of influenza was experienced, which was complicated by disease of the middle ear on both sides, which required puncture of the drums and drainage. He had been an unusually active child and since he first began to walk had experienced great delight in jumping up and down on the balls of his feet.

In March, 1924, upon returning from school, the child complained of pain in the left heel, which he thought was due to a wrinkle in his stocking due to the absence of garters. The following day after school he complained of greater pain and asked his father, a physician, to look at it. The father found the back of the heel inflamed and very painful to

*Read in Section on Bone and Joint Surgery, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., Nov. 9-12, 1925.

the touch. When asked how he injured it, he stated that the stocking had slipped down and rubbed it. The pain became worse despite bandaging and the use of crutches.

He was well developed and well nourished, moderately large for his age, but very active and restless. General examination revealed no existing pathology.

Local examination of the feet revealed some redness and quite marked tenderness over the posterior aspect of the left os calcis. There was also some fullness at the site of the attachment of the Achilles tendon to the os calcis.

No redness or swelling existed at the posterior aspect of the right os calcis but there was a slight increased tenderness upon palpation and the patient admitted that he had some pain on the right side recently.

The x-ray revealed marked absorption of lime salts of the epiphysis of both os calces and disintegration of parts of the epiphysis, most marked on the left side.

The left foot was fixed in plaster and the patient made to use a wheel chair entirely, taking no weight on his feet. The response to this fixation was prompt, and complete resolution occurred. The plaster and freedom from weight bearing were continued for two months. Large doses of cod liver oil were also given. No tenderness has occurred since removal of the plaster and the right epiphysis resolved without fixation.

An x-ray made in February, 1925, showed practically complete recalcification, disappearance of the areas of disintegration and normal shape and size of the epiphyses.

Case II.—J. A., a white boy of ten, applied for treatment August 11, 1925. The family and past histories were unimportant. The mother thought the boy had probably had some trouble with his left heel for almost a year, but he had complained only in the preceding few weeks. The complaint had been principally of pain and tenderness of the back of the left heel. The pain became so constant and severe that the mother took the child to her family physician, who attributed the trouble to blisters on the heel and advised that the patient go bare-footed. Despite this the condition became more painful and disabling. He was an unusually large and well developed child for his age. General examination revealed no pathology.

Local examination of the right foot revealed no lesion of the os calcis. The posterior aspect of the left heel presented some redness and very marked tenderness. This tenderness was so great that he could scarcely bear the pressure of the hand on the heel. No other tenderness was found.

An x-ray made August 11, 1925, showed considerable thickening of the epiphysis of the left os calcis with several areas of disintegration. There was no great amount of absorption of lime salts.

The right epiphysis showed no disintegrating area. August 12, 1925, a plaster splint was applied from the toes to the calf on the left leg and freedom from weight bearing was advised. This fixation was continued for five weeks. Upon removal of the splint on September 21, 1925, no redness or tenderness was found and the patient admitted that he was relieved of pain as soon as fixation was applied. An x-ray made September 22, 1925, revealed that the areas of disintegration had almost entirely filled in both epiphyses and practically complete recalcification had taken place.

CONCLUSIONS

(1) Apophysitis of the os calcis is most common in growing boys during the period of their greatest growth activity.

(2) The condition clinically is usually unilateral, but by x-ray examination the epiphysis on both sides is often involved. Close questioning may reveal that bilateral symptoms have existed, one side being more affected than its fellow.

(3) Freedom from weight bearing, fixation of the extremity to prevent pull of the Achilles tendon and encourage its relaxation and the administration of the bone hardening vitamins in cod liver oil usually entirely relieve the condition promptly and permanently.

(4) The cause of the condition is not clear, but is certainly closely related to other epiphyseal conditions, such as Perthe's disease and Osgood-Schlatter's disease.

DISCUSSION (Abstract)

Dr. O'Ferrall (closing.)—This condition is very much more frequent than has been reported in the literature, and no doubt goes unrecognized. I believe many of the milder cases recover without treatment, experiencing little pain, while others recover despite acute pain and in spite of no treatment. This can also be said of many cases of Perthe's disease and Osgood-Schlatter's disease. In the cases reported, the symptoms were very acute and required the treatment given, which seemed entirely satisfactory and gave prompt and permanent relief.

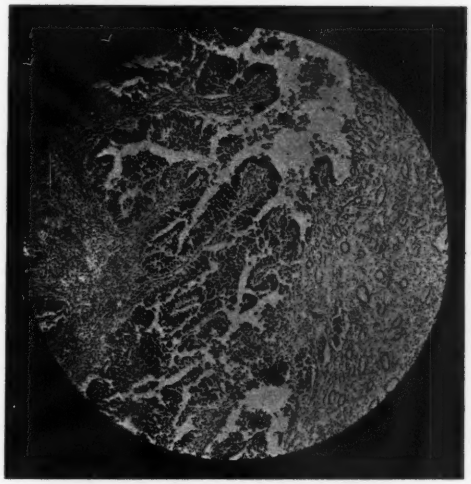
PAPILLARY EPITHELIOMA OF THE KIDNEY PELVIS: CASE REPORT*

By PERRY BROMBERG, M.D., F.A.C.S.,
Nashville, Tenn.

Definition and Histology.—Papilloma by common usage designates that type of tumor, either pedunculated, papillary or villous, springing from a mucous membrane, and composed essentially of a branching framework of connective tissue covered by epithelium in one or many layers.

If there be an accompanying infiltration of the epithelial cells into the substance of the mucous membrane, it then becomes histologically a papillary carcinoma.

*Read in Section on Urology, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., Nov. 9-12, 1925.



Note papillary structure.

In some of these growths, accompanied by evidence of chronic pyelitis or calculus, there seems to be an inherent tendency towards hornification or epidermization, producing that type described as leucoplakia.

Ewing[1] classifies tumors of the renal pelvis and ureter as follows:

(1) Papilloma.

(2) Papillary epithelioma (epidermoid carcinoma).

(3) Alveolar carcinoma.

"Of fifty-four such tumors collected by Albarran and Imbert twenty-two were benign papillomas, sixteen epitheliomas, and sixteen carcinomas."

Judd[2] says:

"Papillary epithelioma produces more numerous and more compact tumors than benign papilloma. They appear as closely set, opaque, warty outgrowths, which are usually found to cover a considerable area Even in the early stages of the growth there is a tendency towards encroachment of the submucous tissue and renal parenchyma.

"In advanced cases the pelvis may be distended and obliterated and fused with surrounding tissues, and the kidney may either be invaded and deformed, or multiple cysts may distend the cortex in hydronephrosis."

Papillary epithelioma shows overgrowth of the cell layers of benign papilloma, atypical cell forms and infiltrating qualities. In infiltrating tumors, the papillary structure is soon lost and the growth is alveolar, or diffuse, or scirrhous.

Morogna[3] says:

"Alveolar carcinoma of the renal pelvis is not clearly distinguished from papillary epithelioma, which in advanced and malignant cases may lose its papillary character and present the structure of alveolar or diffuse or scirrhous carcinoma."

From the above definitions, it is quite evident that the existing confusion due to the multiplicity of terms used in reporting these cases by various authors, should be restricted, or at least, some well established pathological characteristic taught by which they may be standardized.

Genesis.—The origin of tumors of the kidney pelvis is not known. Morogna[3]

"believes that the formation of papillomas of the renal pelvis may be explained by the occurrence of aberrant ectodermal inclusions during the developmental period, excited to proliferation by an inflammatory process."

Stusser[4] says:

"It is not improbable that in the embryo, there is an unusual upward extension of flat-celled epithelium from the Wolffian duct, and that this explains the cases, in which portions of the ureter and pelvis of the kidney are found covered with epidermis, and in which tumors develop with the same type of epithelium."

Scholl and Foulds[5] think that

"squamous-cell tumors of the renal pelvis probably result, in most cases from chronic irritation. Five cases of squamous-cell tumor of the renal pelvis were observed at the Mayo Clinic between 1907 and 1922. Four of these cases were associated with renal stone. The calculi in three kidneys were extremely large and of the staghorn type."

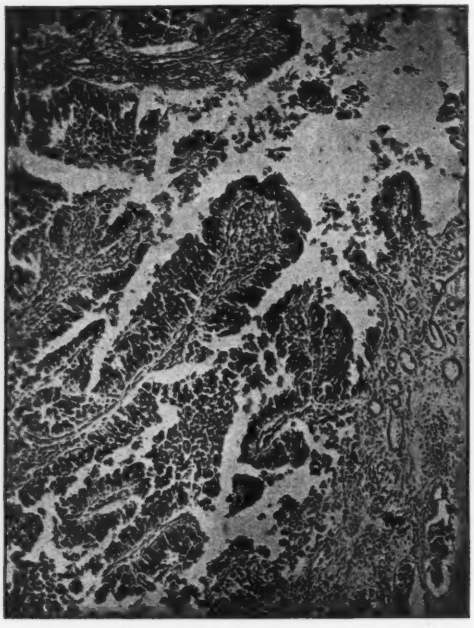
That irritation, either from stone or from infection, plays an important part in the production of epithelial cancer cannot be doubted, for fully 50 per cent or more of the cases which have been reported were superimposed upon either one or the other of these conditions.

Frequency.—That primary papillary epithelioma of the kidney pelvis is an exceedingly rare tumor, is evidenced by the remarkably few reported cases, in comparison with other tumors of the kidney.

McCown,[6] in 1920, reviewing the entire literature, found only ten cases reported by American authors, including his own, and thirty-eight from foreign countries.

Miller and Herbst[7] call attention to additional cases which were reported by Stevens, Hyman and Goldstein, and by Kretschmer (two cases) in the discussion on McCown's paper, to which they also add a personal case.

To the above may be added the reported cases of Lendon[8] and Tikhoff[9] which were evidently overlooked by Dr. McCown: two cases



Note tendency to infiltrate.

subsequently reported by McDonald[10] and the following cases which have been reported since the publication of Dr. McCown's paper: Barney,[11] one case; McAlpine,[12] two cases; Reschke,[13] one case; Salleras,[14] one case; Angle,[15] one case; Darnall,[16] one case; Eggers and Felsen,[17] one case; Jones and Carroll,[18] one case; and Scholl and Foulds,[19] five cases, four of which were definite squamous celled epitheliomas, and one of which contained both squamous and villous tumors. A review of the literature conducted by the department of literary research of the American College of Surgeons fails to reveal additional cases. This brings the total of reported cases up to seventy, to which number I shall add the following case:

Mrs. D. H. M.—Age 53, was referred by Dr. McCampbell, for symptomless hematuria. Her family history was entirely negative. She had had no previous illness which would have any bearing upon her bleeding. She had married at the age of 21, and had two healthy children. Her husband was accidentally killed, but was strong and well. Eight months prior to her visit to me, she noticed blood in her urine. At this time it was definitely intermittent. Several days would often elapse without blood, when without cause it would begin again and for the preceding three months it had been fairly constant.

Complete physical examination was entirely negative. The kidneys were apparently not enlarged to palpation. Her hemoglobin was 50, and she appeared pale, became faint occasionally, and was unable to do her work without effort.

Cystoscopic examination revealed a perfectly normal bladder. Blood was seen spurting from the left ureter, which was not inflamed or enlarged. There was no evidence of papillary growth visible. Number six leaded catheters passed to both kidneys without obstruction and urine dripped from both at an equal rate. The left was definitely bloody, bright and fresh in color. That from the right was clear. One cubic centimeter of phenolsulphonephthalein injected intravenously was returned in four minutes from the right side, which excreted twenty per cent in fifteen minutes. Radiograms of the entire urologic tract were made which were negative to stone. Eight cubic centimeter of twelve per cent sodium iodid was injected into the left pelvis, which produced sharp pain.

The pyelogram showed absence of the middle and inferior calyces with definite blunting of the upper.

The blood Wassermann was negative, the blood hemoglobin 50; white blood cells 10,000; red blood cells 3,800,000. Urine was negative, except for blood and a trace of albumin from the left side.

Tumor of the kidney, probably pelvic, was diagnosed and operation advised.

Operation.—The kidney was exposed through lumbar incision, delivered and except that it felt as if the pelvis were filled with bloodclot, it appeared normal. The kidney with approximately four inches of the ureter was removed. The postoperative recovery was uneventful.

Pathological Report by Dr. B. T. Terry, Vanderbilt University.—The specimen is kidney. Sections 1 and 2 are much alike. The capsule is thickened and at places covered over by fat. The cortex of the kidney shows considerable atrophy. The tubules have disappeared to a large extent. Their places have been taken by connective tissue. The glomeruli as a result of this atrophy are ofttimes closely packed together. There are considerable areas in which scar-tissue has entirely replaced both tubules and glomeruli. The pelvis of this kidney shows papillary projections covered by hyperplastic epithelium which shows desquamation. The epithelium covering these papillary portions seems invasive, as it is found at a considerable distance from the pelvis in certain areas. The epithelial cells vary in size and shape, so as to make the diagnosis of malignancy all the more probable. In one area, this atypical epithelial growth is only a short distance from tubules which apparently represent convoluted tubules. Nowhere are malignant looking areas seen growing between glomeruli.

Many of the glomeruli in the most superficial portion of the cortex have been reduced to hyalin balls. A rather extensive hemorrhage has occurred beneath the capsule of this kidney. Many of the blood vessels are narrowed by arteriosclerotic changes.

Slides 3 and 4 are much alike, and the following description serves for both: The sections show a large mass of necrotic tissue in which here and there are seen a few masses of living epithelial cells of varying size and shape. The masses are apparently identical with those seen covering the papillary projections in the first section. The living epithelial cells in sections 3 and 4 are seen here also as papillary projec-

Vertical section through pelvis.

tions and at places seem to run along the outer border of the necrotic tissue, much as epithelial cells do over granulation tissue in healing wounds.

With the exception of a little connective tissue and bloodclot, nothing else worthy of note is observed in sections 3 and 4.

The diagnosis is papillary epithelioma of the renal pelvis.

Clinical Diagnosis.—The patients in the vast majority of cases present themselves for hematuria and it is in an effort to explain the cause of bleeding, that a diagnosis of tumor is made. Very rarely, but in occasional instances, pain is the predominant symptom, colicky in character and due no doubt as Cumston[20] suggests, to obstruction of the ureter by the pelvic neoplasm, producing a temporary hydronephrosis or if blood be present a hematonephrosis. The pain is colicky in character and bears the closest resemblance to that produced by the passage of an organized bloodclot, or so-called "fibrinous calculi," not infrequently expressed as "clot colic." Palpable tumor was noted in about one-third of the cases studied by McCown, (fourteen out of forty-seven), abdominal pain in eight instances; and frequent and painful urination in six. Metastasis was noted by eleven authors, either at the time of the examination or developing later in the course of the disease. McCown suggests the diagnostic importance of unidentified shreds or bits of epithelium in the urine drawn from the kidney.

Diminished kidney function will be found to be fairly constant and the usual function tests will ordinarily suffice. Pyelograms are of great importance, particularly in the more extensive growths whose volume fills either partially or completely, the kidney pelvis. The various types of deformity which may occur, are too numerous for mention. We should remember, however, that this is but a symptom and that a diagnosis cannot be made by a pyelogram alone. The presence of bladder papillomas, especially if they spring from the mouth of the ureter, or from within the ureter, should be given careful consideration, as nearly half the cases studied by McCown showed extension of the renal growth to the ureter and to the ureteral orifice or bladder in seventeen of the forty-seven cases.

Sex.—The tumors seem to be more common in males than females, in the proportion of two to one.

Age.—They occur usually in rather advanced age. McCown found five in the thirties, seven in the forties, seventeen in the fifth decade, nine in the sixth, three in the seventh, and one in the eighth.

Treatment: Nephro-Ureterectomy.—In view of the very marked tendency towards recurrence, conservative treatment should not be undertaken, but a radical removal of both the kidney and the ureter, either in one or two stages, provided, of course, that the opposite fellow is functionally competent and unaffected.

It should further be remembered that an apparently benign growth, may at any time change to a malignant one.

BIBLIOGRAPHY

1. Ewing, James. Neoplastic Diseases; a Text Book on Tumors. W. B. Saunders Co., Phil. and London, 1919.
2. Judd, E. S.: Rochester, Minn., The Journal Lancet, May 15, 1919.
3. Morogna, P.: Contributo allo studio dei papilloma del bacinetto. 11 Poloclinico, 21, Seg. chir. 377-391, 1914.
4. Stusser, F.: Primary Epithelial Neoplasms of

the Pelvis of the Kidney. Beitrz Klin. Chir., Tubing., 80, 563-592.
5. Scholl, Albert J., and Foulds, Gordon S.: Squamous-cell Tumors of the Renal Pelvis. Annals of Surgery, No. 4, pp. 594-605, October, 1924.
6. McCown, P. E.: Papillomatous Epithelioma of the Kidney Pelvis. J. A. M. A. 75, Oct. 30, 1920.
7. Miller, E. M., and Herbst, R. H.: Papillary Epithelioma of the Kidney Pelvis. J. A. M. A., April 2, 1921.
8. Lendon, A. A.: Case of Papilloma of the Kidney; with Pathological notes, by W. R. Cavenaugh, Mainwaring Australas, M. Gaz., Sydney, 24, pp. 527-531, 1905.
9. Tikhoff, P.: A case of Papilloma of the Pelvis of the Kidney. Arch. prov. de. chir., Par., 10, pp. 143-148, 1901.
10. McDonald, S. G.: Two cases of Papilloma of the Kidney, Proc. Royal Society Medicine, London, Sect., Urol., 14, pp. 31-33, 1920-1921.
11. Barney, J. D.: Papilloma of the Renal Pelvis. Boston, M. and S. J., 188, p, 716, 1923.
12. McAlpine, J.: Specimens of New Growths of the Pelvis and Kidney. Proc. Roy. Society Medicine, London, 16, pp. 37-38, Sec., Urol., 1922-1923.
13. Reschke: Papilloma of the Renal Pelvis. Arch. F. Klin, Chir., Berl., 129, pp. 431-433, 1924.
14. Salleras, Juan. Papillary Epithelioma of the left Kidney Pelvis: Nephrectomy: Recovery. Semana Med., Buenos Aires, 21, pp. 1425-1428, 1924.
15. Everett, E. Angle, Papillary Epithelioma of the Kidney Pelvis, Report of a Case, Surg. Gynec. and Obst., 23, pp. 790-792, 1924.
16. Darnall, William Edgar: Malignant Papilloma of the Kidney. Surg. Gynec. and Obst., 35, pp. 493-495, 1922.
17. Eggers, Carl, and Felson, Joseph: Papillary Epithelioma of the Kidney Pelvis, J. A. M. A., 72, pp. 1415-1417, 1924.
18. Jones, Walter M., and Carroll Grayson L.: Papillary Epithelioma of the Kidney Pelvis. Annals of Surg., pp. 591-593, October, 1924.
19. Scholl, Albert J., and Foulds, Gordon S.: Squamous-cell Tumors of the Renal Pelvis. Annals of Surg., pp. 594-605, 1924.
20. Cumston: Neoplasms of the Renal Pelvis and Ureters, with the Report of a Case. Am. Jour. Urol., 9, pp. 21-26, 1913.

LOW OR CERVICAL CESAREAN SECTION*

By MINFORD ARMOUR HANNA, M.D.,
Kansas City, Mo.

Today no one can boast of originality with assurance unless he has made an exhaustive research in the world's history, literature, and science. If he omits this preparation, he may present that which is in the process of development or has been perfected, and his efforts will result not only in an attempt to mislead others, but in deceiving himself, either or both of which brand him as unreliable and superficial.

No priority is claimed for the following presentation of this subject, but it is an effort, based on the cumulative knowledge of experience, to feature the correlated results of recognized authorities.

You will recognize the outstanding points in the literature published on low or cervical cesarean section in connection with the following notes and comments. They also confirm my concurrence with the later data on the advantages of this operation which, under ordinary conditions, gives an equal opportunity for the mother and baby. In cases known to be infected, the low or cervical operation has lowered the maternal mortality rate.

The operation of cesarean section is associated with more romance and greater antiquity than any other surgical procedure. It has been utilized by the spectacular and unscrupulous surgeon as a means of exploiting his skill when his patient was a subject for other procedures, and by using it he has most glaringly brought out his ignorance of the science and technic of obstetrics. But the history of obstetrics proves that either the ultra-conservative or radical method always has received popular approval to the sacrifice of the rational adaptation of the best methods of each, and at this time it is obviously a fact that conservatism is in the ascenddency in the treatment of such conditions as eclampsia, placenta previa, and in the application of indications for cesarean section.

The modern procedure in cesarean section may be stated to have been developed since Sanger's first publication of his technic in 1880. Prior to that time, the collected statistics on cesarean section show a very high mortality, and in the light of our present knowledge we marvel more at the fact that any of the mothers recovered from the operation rather than are we astonished at the high mortality rate.

Important Factors in Development of Cesarean Section.—In reviewing the history of the operation, several factors stand out in bold relief and indicate the stages in the progress of the development of the procedure.[1] These factors are the careful suturing of the wound in the uterus; the performance of the operation under anesthesia; the application of antiseptic, and later aseptic methods; the Sanger technic; and the use of absorbable suture material.

While the operation devised by Sanger must be regarded as marking an epoch in the history of cesarean section, immediately following his work progress became so rapid that at the present time his methods are regarded as crude, productive of unnecessary shock, and unsatisfactory in the after-effects, although his technic as published in the early eighties was far in advance of any previously employed procedure.

*Read in Section on Obstetrics, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

SANGER'S PROCEDURE[2]

After cleansing the abdomen and the vagina with an antiseptic solution, a long median incision was made extending from a point a short distance below the umbilicus down to the symphysis pubis. The long sutures were inserted at the upper angles of this wound and the pregnant uterus was delivered through the opening, after which the sutures were drawn together and tied so as to close off the upper part of the abdominal opening and hold back the intestines. The lower portion of the uterus was then surrounded with a rubber dam further to protect the peritoneal cavity from blood, liquor amnii, and meconium. An Esmarch rubber band encircled the lower uterine segment and was drawn tight by an assistant in order to control hemorrhage. The uterus was finally opened in the median line from a point just below the fundus down to the cervix, followed by the delivery of the child, placenta, and membranes. The edges of the uterine wound were trimmed and sutured in three layers, one deep, and one superficial layer of interrupted sutures, and a final layer of Lembert sutures, after which the uterus was returned to the abdominal cavity and the wound in the abdominal wall was closed.

Modern Interpretation of Cesarean Section.—The modern interpretation of cesarean section has three ideals, the prevention of peritonitis, the clean, well-united uterine incision, and the safety of subsequent pregnancies. In order to obtain these ideals, special surgical procedures are used, involving intra- and extra-peritoneal approach, the supra-vaginal and the low or cervical incision.[3] The indications for choosing a particular operation at this time are more or less chaotic, but are rapidly pointing to the low or cervical cesarean section as the one that offers the lowest mortality rate in all classes of cases.

LITERATURE

Much of the early literature relative to indications for cesarean section now is considered obsolete for the indications cited include almost every pathological condition found in the female. For example, a rare and unusual case is recorded where a version and extraction was done with the delivery of the baby to the head, then a decapitation was performed, followed by an abdominal section to deliver the head.[4] In another case, a repair of the perineum had been done and a cesarean section was performed in a subsequent labor to prevent injuries to the birth canal. Still another indication evidently established by a peculiarly illogical grasp of the subject is recorded and designated as dystrophia-dystocia syndrome. The chief characteristics of the dystrophia-dystocia syndrome are as specified. The patient conceives for the first time late in life, or has had a sad obstetrical experience. She is usually a heavy-set woman with hypopituitary characteristics. The available space in the pelvis is somewhat smaller than normal and the extremities are short and thick. The patient generally goes beyond time and the fetal head in the occipito-posterior position remains above the pelvis, even after many hours of labor. When delivery through the birth canal is attempted, the result is usually disastrous to the child and inflicts irreparable injury to the mother. In view of this danger, and because many of these patients may never become pregnant again, it is supposed advisable to do a cesarean section to deliver a living and uninjured child, and to avert serious traumatism to the birth canal. It is my observation that such a procedure might be avoided in this type of case by giving the patient very careful prenatal care, and induction of labor should be attempted a reasonable length of time before term.

Joseph B. DeLee[5] believes a certain percentage of the high death rate of child-bearing women in the United States, which ranks fourteenth in maternal mortality among the nations of the world, is due, in part, to the frequent performance of cesarean section. So far as traumatism of the viscera is concerned, he states that he has seldom opened an abdomen after cesarean section has been performed without finding adhesions.

Cesarean section carries with it the definite risk of an abdominal surgical intervention and entails more risk to the mother under ordinary conditions than delivery through the birth canal. The definite indications for cesarean section, in view of the conservative treatment of toxemia of pregnancy and placenta previa, are rapidly narrowing to a very definite group. Laws restricting immigration to this country and a simultaneous development of higher physical standards are rapidly eliminating the contracted pelvis as an indication, for it is rarely found in the American-born woman. The rachitic type[6] is practically the only one that would warrant abdominal section, as a premature induction of labor in other types will practically insure a living child, and it has been our experience that the baby delivered two or three weeks previous to term has as good a chance for life as an oversized, post-mature baby.

Another problem involved in cesarean section

is that of sterilization.[7] The written consent of both the patient and her husband must be obtained, and from a scientific viewpoint sterilization involves the best interests of the mother, future progeny, the community, and oftentimes the church. Yet every case presents an intricate complex which must be studied carefully, and any procedure or technic presented must be susceptible to change to meet the demands of the individual.

From a surgical viewpoint[8] we consider certain decompensating cardiac conditions, placenta previa centralis in the primipara, premature separation of the placenta, and in the elderly primipara with undilated and elongated cervix at term, certain contracted pelves, and obstructive neoplasms in the pelvis as positive indications for cesarean section.

LOW OR CERVICAL CESAREAN SECTION

Our attention was first attracted to low or cervical cesarean section by Dr. John Osborne Polak in 1920, who reported 40 post-mortems on cesarean section cases that had died from peritonitis, and in every case the infection had invaded the abdominal cavity through the uterine incision. Since that time we have employed the low or cervical cesarean section exclusively, even when using local anesthesia.[9] Also Dr. DeLee has featured low or cervical cesarean section, and reports 330 operations with two maternal and two fetal deaths. According to Dr. DeLee and Dr. Barton Cook Hirst,[10] the great measure of assurance as to the life of the patient and the safety of her future pregnancies afforded by the low operation lies in the location of the incision in the lower abdomen and in the cervix, which has a greater immunity to infection. This location places the wound where it can unite undisturbed by recurring after-pains. And in the event that contamination does occur, it will be manifested in that part of the abdomen which has the greatest resistance to infection, and which is most advantageously located for drainage. The low operation requires from five to eight minutes longer than the classical procedure and is most admirably adapted to those cases that have been in labor a few hours.

Technic of Low or Cervical Cesarean Section. The technic of the following low or cervical cesarean operation is, with a few minor modifications, essentially that of Dr. DeLee. The abdomen is shaved and prepared with a two minute application of McDonald's solution. The patient has been catheterized with a soft rubber catheter just prior to the operation. Gas-oxygen and ether are generally employed as an anesthetic. The incision, about 14 cm. long, is made in the median line and should begin below the umbilicus and terminate near the pubis. A similar incision is made through the fascia and parietal peritoneum, avoiding the linea alba. The abdominal walls are retracted, exposing the lower uterine segment. At this point 1 c.c. of pituitrin is given subcutaneously in the thigh. A transverse incision is made through the uterine peritoneum from approximately one broad ligament to the other and about one inch above the bladder fold. The lower flap of the peritoneum is dissected down, carrying with it the bladder. The upper flap, with more difficulty, is lifted upward by using dissecting scissors. The peritoneal flaps are then retracted with small, short retractors, exposing the uterine muscle. Through this muscle a longitudinal incision is made by using a blunt-end tonsil knife, the use of this instrument being a safeguard against the premature rupture of the bag of waters. A special suction instrument commonly used in bladder work is attached to a tonsil machine and prevents the spill of foreign fluids into the abdominal cavity. The baby is delivered either by version and extraction, manual delivery of the head, or by using instruments. The placenta and membranes rapidly follow the delivery of the child and a hot saline pack is temporarily placed in the uterine cavity. The upper and lower angles of the uterine incision are grasped with tenacule and the uterine muscle, avoiding the endometrium, is closed with a continuous No. 2 catgut suture. If the thickness of the tissues warrants, another superficial line of continuous sutures is run through the uterine muscle. The upper flap is then anchored to the uterine muscle with continuous catgut sutures in a curvo-linea line, about one inch below the original attachment of this flap. The lower flap carrying the bladder is likewise sutured to the upper flap, thereby assuring a raw surface contact with the upper peritoneal flap.

It is not necessary to make the toilet of the abdominal cavity before closing it, because nothing has been spilled that might become a source of contamination. The intestines and the omentum have not been disturbed, and there is little opportunity for adhesions. The parietal peritoneum is closed by everting the edges, thereby further lessening the possibility of adhesions. The abdominal wound is closed in the classical manner.

CASE HISTORIES

We present two cases, eliminating minute detail. One case shows the tremendous possibilities of the operation in so far as prevention of complications is concerned, and the other case exhibits one of the disadvantages of the procedure.

The first case seen in consultation was a primipara in labor 48 hours, with a premature rupture of the bag of waters, and with an impacted face presentation. The attempt, with the patient under anesthesia, to convert the face into a vertex was unsuccessful, due to the extreme molding of the baby's head. On account of the patient's great exhaustion, she was given a 12-hour rest under narcotics. In view of the fact that the baby was still alive, and there had been numerous vaginal manipulations, and since it was impossible to deliver the baby through the birth canal, either by version and extraction or by using instruments, not to mention the hazards of a ruptured uterus, it was decided to do a low or cervical cesarean section. Twenty minutes before the hour set for the operation, the patient had a severe chill, followed by a temperature of 107°. Notwithstanding her most unsatisfactory condition, the low or cervical cesarean section was performed as scheduled, and the mother and baby left the hospital in good physical condition two weeks later. I delivered her 18 months later of another baby through the birth canal.

The case chosen to illustrate one of the disadvantages of the low or cervical cesarean section was a patient with contracted pelvis, who had previously lost two babies, each at the time of delivery. She came to me before pregnancy and exacted an assurance that I would practically guarantee her a live baby before she would attempt pregnancy. Near term she was given a trial labor by hydrostatic bag. She experienced a rapid, violent labor, and after a few hours exhibited evidences of an impending rupture of the uterus. I attempted a low or cervical cesarean section, but owing to the fact that the uterus was in tetanic contraction and would not relax in delivering the head, the left side of the uterine incision tore at right angles into the pampiniform plexus, precipitating a severe hemorrhage which was controlled with extraordinary difficulty. In fact, after numerous ligations, there still was an alarming ooze. It being a venous bleeding, it was easily controlled with a gauze pack extending through the abdominal incision. The pack was removed at the end of three days under gas-oxygen anesthesia. The mother and baby left the hospital at the end of 18 days without any unpleasant complications, except a small ventral hernia at the site of the pack.

CONCLUSIONS

The following facts are the outstanding reasons for the employment of the low or cervical cesarean section:

Low or cervical cesarean section reduces the danger of a ruptured uterus in subsequent labors.[11] If a ruptured uterus should occur, the rupture will be located where there is little liability of serious complications.

The operation lowers maternal morbidity and mortality.

It prevents a spill of meconium and liquor amnii that would soil the peritoneal cavity.

Low cesarean section provides the opportunity to give the parturient a real test of labor before concluding that abdominal delivery is necessary.

There are less shock, bleeding, and fewer chances for post-operative sequelae in low or cervical section.

It provides a safe method for delivery in cases where the classical operation often would be followed by peritonitis.

There are no raw surfaces or suture lines left that could be the site of adhesions.

In low or cervical cesarean section the denuded surface of the lower flap is in direct contact with the peritoneal surfaces of the upper flap. This insures union within a few hours.

The development of local anesthesia makes it well within the province of surgery to deliver by low or cervical cesarean section, with comparative comfort and safety, those cases suffering from heart, lung or kidney pathology.

In final conclusion, this monograph will not be in vain if we succeed in attracting the attention of the general surgeon, whose obstetrical judgment may not be as keenly developed as his surgical skill, to the following outstanding facts, namely: it is no longer accepted as modern technic to make an incision from the ensiform cartilage to the symphysis pubis and deliver the uterus on the abdomen before delivering the baby. With the judicious use of pituitrin, it is not necessary to grasp the broad ligaments in order to control hemorrhage and the danger of shock which is associated with the delivery of so large a viscus as an impregnated uterus, and the attendant possibilities of infection, make this procedure frowned upon by men versed in careful surgical technic.

BIBLIOGRAPHY

1. Loomis, Phaneuf: The Transperitoneal Cervical Cesarean Section. Bull. Lying-In Hospital, New York City. 13, No. 1, 1924.
2. Davis, Asa B.: Extraperitoneal Cesarean Section in Presumably Infected and Mismanaged Case of Prolonged Labor. Bull. Lying-In Hospital, New York City. 13, p. 68, 1924.
3. Schilling, Nicholas: Extraperitoneal Cesarean Section. Jour. of the Iowa State Med. Soc. 13, p. 445.
4. Greenhill, J. P.: The Dystrophia and Dystocia Syndrome as an Indication for Cesarean Section. Surg. Clinics of North America. 4, No. 3, June, 1924.
5. DeLee, Joseph B.: Low or Cervical Cesarean Section. J. A. M. A. 84, No. 11.
6. Cameron, S. J.: One Hundred Cesarean Sections in Cases of Contracted Pelvis. Edinburgh Med. Jour.
7. Swift, John S.. When Is Sterilization Indicated

Following Cesarean Section. J. A. M. A. 83, No. 3, July 19, 1924.
8. DeNormandie, R. L.: Boston Med. and Surg. Jour., June 28, 1923.
9. Roos, Edmund C.: Cesarean Section Under Local Anesthesia. Ill. Med. Jour. 43, No. 1, 1923.
10. Hirst, B. C.: The Place of the Low Cervical Cesarean Section. J. A. M. A. 82, No. 2, Jan. 21, 1924.
11. Greenhill, J. P.: Once a Cesarean Section, Always a Cesarean Section: An Untruth. Am. Jour. of Obst. and Gyn. 5, No. 1, Jan., 1923.

DISCUSSION (Abstract)

Dr. Willard R. Cooke, Galveston, Texas.—I am almost convinced, from a limited personal experience, and through observation of results published by others, that the low cesarean section is as great an improvement on what is now generally called the classic cesarean as that, in turn, was an improvement on the old operation in which the opening was made into the fundus instead of in the anterior wall of the uterus.

The only thing which prevents my accepting this as a fact is that as yet the accumulated statistics are not sufficiently extensive to permit us to judge of the relative strength of the scar in this location in subsequent pregnancies. Although the data published up to the present, especially in certain English journals, are extremely favorable, a little more time must be allowed to elapse before we can consider that this point is settled in favor of the low operation.

In practice, I have found that occasionally there is not sufficient room in the passive segment of the uterus for an incision long enough to permit extraction of the head, especially if this be oversize and labor not far advanced. In this case, I have found it better to make the extra incision necessary, upward into the lower part of the active segment, rather than downward into the anterior wall of the vagina. On account of the difficulty of repairing these anterior vagino-cervical incisions, it is decidedly better to make this extra incision, whether it be upward or downward, than to attempt to drag the head through too short an incision, trusting altogether to the elasticity of the tissues, since in these cases not infrequently a laceration may be started which may prove very difficult to repair.

I made use of this principle in three cases in connection with the isolation of the peritoneal cavity by suture along the line of the round ligament and in a sort of Gothic arch from one ligament to the other anteriorly in delivering cases which had been potentially infected and in which the only alternative would have been destructive operation on the fetus. In these three cases the outcome was all that could have been asked for, although very frank and severe local infection ensued upon the operation, and it may be that further experience along this line will prove this modification of technic to be of service.

Dr. Hanna (closing).—I wish to give Dr. Otto Schwartz credit for his work in investigation of the scar following incision of the uterus. However, I am not, at this time, convinced that the scar, located in the lower uterine segment, even though it should be proved to be more vulnerable in future pregnancies, should influence a decision in selecting the low or cervical cesarean section as a procedure of choice in infected cases.

After having employed this operation in a very limited number of 22 cases, I am convinced that it should not be universally adopted to the exclusion of the classical procedure, but that it has a definite application in those cases that have experienced manipulation through the birth canal during trial labor, or are known to be infected. It has not been demonstrated to my satisfaction that a scar in the lower uterine segment is more apt to rupture than one in the fundus. Even if the danger of a ruptured uterus from a low cervical scar is eventually determined to be greater, I feel that the advantage of this operation in lessening the maternal mortality risk would still warrant the choice of this procedure.

I have delivered 18 patients through the birth canal, who had previously had cesarean sections, without any unfortunate consequences. In any case where any attempt is made to deliver a baby through the birth canal following cesarean section, the patient should always be hospitalized and kept under constant observation during labor with every facility in readiness for immediate interference in the event of impending rupture of the uterus.

I agree with Dr. Cooke that it is better to extend the incision upward than downward, and in the event of a large baby, not to trust too much to the elasticity of the tissues and thereby permit a tear in the broad ligaments.

MAJOR POST-OPERATIVE CONDITIONS FOLLOWING ACUTE SUPPURATIVE APPENDICITIS*

By FRANK L. BARNES, M.D., F.A.C.S.,
Houston, Tex.

If a statement, quite elementary, may be pardoned, I would like to observe at the outset that all operations on the appendix are primarily intended to prevent, to control or to remove complications already present or pending.

What we term post-operative complications are not usually, in a strict sense, post-operative, because they are the result of a continued action of the infection present prior to the operation. However, in a majority of suppurative cases an operative technic can be so well planned and so carefully carried out as effectually to remove or control the infection present and in these as in clean cases, such complications as follow, may be classed as true post-operative conditions.

GENERAL PERITONITIS

First in importance among these complications is general peritonitis, but fortunately also it is the most rare. It is not my purpose to discuss this condition as to signs and symptoms, because every surgeon can conjure up in his own mind pictures of cases, both expected and un-

*Read in Section on Surgery, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

expected, their beginning and their end. To those operators whose accommodating goodness exceeds their scientific exactions, post-operative peritonitis may be Providence. "The Lord giveth and the Lord taketh away." The more scientifically accurate will seek another explanation of the condition. Peritonitis may result from the simplest break in technic, and it is needless to say that the high trump in its prevention has been played when the operation has been performed. A surgical judgment, born of a thorough training and wide experience, coupled with a good technic scrupulously carried out and a sense of touch on the part of the surgeon which radiates almost beyond his finger tips, will go a long way toward preventing the spread of any, more or less localized, infection in the abdomen.

Procedure.—The incision should be adequate for easy work in gently packing off the intestines and protecting the pelvis and kidney space and, if possible, in identifying the appendix mass before disturbing it. The appendix mass is very gently palpated, a line of cleavage sought and very gently followed. By this method, in a majority of cases, the appendix mass will be brought within reach and it can be removed without rupture.

The old dictum to get in quickly, put in a drain and get out quickly, I think, is bad practice in a majority of cases, because it frequently leaves the patient with too much to overcome. I have felt convinced for a long time that the profoundly toxic and septic cases with rigid and more or less distended abdomens which we formerly saw were not in that condition because of anything in the immediate vicinity of the appendix, but because the infection had already spread beyond the appendix area and could not therefore be reached by a simple stab wound type of drainage. These patients bear a fair amount of surgery reasonably well, provided it removes a definite hindrance to their recuperative power.

Pus in Pelvis and Rectal Examination.—If a case of acute suppurative appendicitis has run on for 36 or 48 hours or longer, with tenderness and slight distention extending across the lower abdomen to the left and the patient shows signs of toxemia, there is pus in the pelvis. In this type of case, I insist upon a rectal or vaginal examination for fluctuation in the pelvis prior to operation.

Rubber Tube Exploration of Pelvis.—In all acute cases not thoroughly walled off by adhesions where there is free pus, however small in amount, and especially if there is perforation, it is my practice, after removing the appendix, to explore the pelvis with a soft rubber tube. This tube is about one-half inch in diameter, is passed down to the bottom of the cul de sac, and, if pus is found, is left there for drainage. I have on many occasions surprised bystanders and often myself, after clearing out a suppurating appendix area with practically no pus in sight, by slipping a tube into the pelvis and bringing to light a great gush of pus.

On other occasions patients have failed to do well for several days following a drainage operation until by some movement of the body turning on the side, perhaps, a great quantity of pus was discharged through the drainage wound. I feel sure that this was from the pelvis, and was probably present at the time of operation.

There is little risk in exploring the pelvis with a soft rubber tube in any acute suppurative case. It is imperative under the following conditions: (1) When tenderness and distention are progressing across the abdomen to the left; (2) in early perforation; (3) in cases where patients have remained long on foot after the beginning of the attack or have made a journey in automobile or day coach; and (4) when fluctuation is found on rectal or vaginal examination.

The rectal or vaginal examination is always in order, is always necessary and should always be made, and, as a feature in post-operative survey in cases not doing well, it is especially valuable.

SYMPTOM-COMPLEX

As long as a suppurating appendix remains intact, the pain in its area is increased by a fairly full urinary bladder and the pain may be reflected to the rectum. The patients sometimes find that the pain is relieved by emptying the bladder, but the pain does not of itself create a desire to void. When the appendix perforates and pus gravitates to the pelvis, the bladder distends until it is painful, the patient has difficulty in voiding, and frequently has to be catheterized. Symptoms from the rectum develop somewhat later, and usually there is at first a sense of heaviness and fullness in the rectum to be followed later by symptoms closely simulating dysentery. This may, at times, be so distressing as to convince the attendant that he is dealing with a separate and distinct disease entity.

A low grade septic fever which continues after cleaning out an apparently localized appendix area, especially if associated with the above

symptoms, almost certainly means pus in the pelvis.

SUB-DIAPHRAGMATIC INFECTION

The same type of fever coming on several days or several weeks after operation, or following neglected cases, or cases in which the appendix was retro-cecally placed, or where the appendix was not removed at operation, almost certainly means a sub-diaphragmatic infection.

A large majority of the sub-diaphragmatic infections I have treated and observed have been in three types of cases, namely: (1) where the abdomen was drained, the appendix not being removed; (2) in cases long neglected; and (3) in recurrent attacks of acute suppurative appendicitis. All of which means the same thing, that an appendix once the subject of a suppurative process is peculiarly liable to infect the sub-diaphragmatic tissue if it remains too long in the abdomen. This complication, I think, is more likely to occur if the appendix is placed retrocecally. The complication of sub-diaphragmatic infection is an extremely dangerous one, and for this reason the early and complete removal of every septic appendix justifies considerable hazard.

In cases of appendiceal abscess where the abscess is thoroughly walled off and there would be danger of breaking through the adhesions and spreading infection to the peritoneum, the appendix should be left until the infection in the surrounding area is controlled by drainage, but in all cases where adhesions are not adequate, and where there is a perforation or free pus, I would not only advocate removal of the appendix but rubber tube exploration of the pelvis.

POST-OPERATIVE ILEUS AND ILEOSTOMY

Post-operative ileus is usually due to a localized peritonitis about the appendix area, or to adhesions among the small intestines either in the pelvis or along its brim, or to adhesions between the intestines and the abdominal incision, or occasionally to a kink produced by the ileum looping itself about a drain.

All cases of pus in the pelvis without adequate drainage result in a matting together of the small intestines, which is likely to produce obstruction.

Obstruction is the most important of all post-operative complications, because while it is the most deadly it is also the most remediable. It demands early action, requires of the surgeon definite decision and tries his moral courage to the uttermost. Nothing should stand in the way of early action, which is the patient's only chance.

If obstruction occurs within a few days after a drainage operation, an ileostomy will probably afford the quickest relief and greatest security. This should be done as soon after the beginning of obstructive symptoms as possible. It is probably best done through a separate incision, and usually under a local anesthetic. If practicable, it should be placed at a point as low down on the ileum above the obstruction as possible, but in desperate situations it is probably better to open the original incision and secure the first distended loop of intestine presenting.

In cases not drained, or where the drainage wound has closed, the abdomen is opened and the hand passed in to search for and release the obstruction, and ileostomy in these cases is usually unnecessary.

In obstruction associated with general peritonitis, I have not seen ileostomy, even multiple enterostomies, do any good.

309 Carter Bldg.

DEFICIENT FIXATION OF THE RIGHT COLON*

By FRANK C. BEALL, M.D., F.A.C.S.,
Fort Worth, Texas.

A survey of the literature of visceroptosis reveals a mass of confusing and conflicting statements. Since Glenard,[1] in 1885, first focused the attention of the medical profession upon the condition, its etiology and pathological significance, in particular, have been the source of much speculation and many theories. The condition has been variously attributed to nutritional disturbances, to a congenital weakness of the nervous system, to faulty body posture, to constipation, to tight clothes, to pregnancy, to overwork, to undernourishment, to digestive disturbances in childhood and to congenital faulty development of the gastro-intestinal tract. Some consider it the cause of symptoms, others the result of a condition which is causing symptoms, while still others contend that the position of the abdominal organs is normally subject to extremely wide variations and is without any pathological significance whatever. The subject is extremely complex and a consideration of all its

*Read in Section on Surgery, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., November 9-12, 1925.

angles would be too time-consuming and would take us too far afield from the purposes of this discussion. I shall, therefore, simply try to bring before you a small part of the salient anatomical, roentgenologic and clinical evidence in support of the view that a part, at least, of the distressing symptoms which accompany a low position of the abdominal organs is due to a congenital faulty fixation of the ascending colon, and to indicate the results of my own experience with therapy based upon this conception.

ANATOMICAL CONSIDERATIONS

In the majority of the members of the human family during development, the posterior peritoneal covering of the primitive mesocolon of both the ascending and descending colons becomes fused with the peritoneum covering the posterior abdominal wall, and these parts of the colon become relatively fixed. Treves[2] states that, in a careful examination of 100 subjects, he found a mesocolon on the left side in 36 cases and on the right side in 26 cases. Bryant,[3] from 290 unselected post-mortem examinations, reports extreme ptosis of the region of the ileocecal valve, in adult life, as occurring in 12.1 per cent of males and in 39.4 per cent of females. Averaging these, we have practically Treves' 26 per cent of persistent mesocolon on the right side. Bryant says that visceroptosis affecting the liver, stomach, kidneys and pylorus is never present at birth, while visceroptosis affecting the large intestine, in both sexes, is largely congenital. The statement of Bryant that ptosis of the liver, stomach and kidneys is never congenital is borne out by the work of Smith[4] and Butler.[5] They, from a physical and roentgenologic examination of several hundred children (Smith, 109; Butler, 155), say that the liver, stomach and kidneys are rarely low in children before the twelfth year.

In the consideration of abdominal visceroptosis, the attention of clinicians has been so centered upon the position of the stomach and transverse colon that there is little available data in regard to the position of the cecum and ascending colon in children. Richard Smith, in the article referred to above, "A Study of Children with Reference to Enteroptosis," says:

"The enteroptotic habit of adult life finds its counterpart in the frail child, presenting the same fundamental characteristics: frailness, lack of fat, slenderness of muscle, lack of vigor in muscle development. Any actual collapse of the thorax or diminution in capacity of the upper abdomen is seen only in older children, and then only exceptionally in frail subjects. The muscular insufficiencies of later life in enteroptotic women are common in frail children. The prolapse of kidneys, stomach, colon and intestines which accompany the enteroptotic habit of adult life is not outspoken in childhood." He expresses the opinion that "the habit itself is of far greater importance to the enteroptotic woman than the prolapse of the viscera which accompanies it."

Had Smith made accurate observations on the position of the cecum and ascending colon in these children, I am inclined to think his opinion would have been somewhat modified.

In this connection it might be well to call attention to an article by Moody, Van Nuys and Chamberlain,[6] which has been widely quoted by those who believe that the position of the abdominal viscera has little significance. They reported the examination of 600 healthy individuals, 300 males and 300 females in reference to the position of the abdominal organs. In regard to the colon they have this to say:

"The colon also has a large range of normal positions and shapes. The hepatic flexure may be caudad to the interiliac line or several centimeters cephalad to it; the splenic flexure may be caudad to the line or extend cephalad almost to the diaphragm; one flexure may be high and the other low in the same person. The transverse colon is most variable in position, but in these 600 subjects is always found caudad to the stomach, sometimes in contact with the stomach but often dipping far caudad to it. This part of the colon has most often the shape of a loop with its convexity caudad. It is frequently found in the true pelvis, reaching as low as the symphysis pubis. In some cases this part of the colon is shorter and approximately transverse in position; in a few cases it passes obliquely cephalad. The low position of the loop is so common that it must be called normal, and the use of the term coloptosis, like gastroptosis, is rarely justified."

They do not mention the cecum or ascending colon, but in all but one of the illustrations which they show, the cecum is well up in the right iliac fossa.

Harris and Chapman[7] also, from a study of 100 gastro-intestinal patients, conclude that the position of the stomach and transverse colon has little to do with symptoms. They consider gastroptosis normal with a considerable proportion of men and women, but believe that a person with gastroptosis is more apt to have gastric disturbances than one of normal type. A paradoxical statement! They do not report observations on the right colon.

AN ORTHOPEDIST'S CONCEPTION

Goldthwait[8] has considered visceroptosis the result of faulty body poise. He says:

"A drooping posture causes lessening of space in the upper abdomen with lowering of the diaphragm and a backward displacement of the costal margin with contraction of the space under the ribs. This results in a

crowding downward of the stomach. The support of the body is thrown upon the posterior muscles and the abdominal muscles are relaxed. The abdomen protrudes, the capacity of the lower abdomen becomes greater and the abdominal organs tend to assume a lower level. The diaphragm is attached low behind the kidney. Its lowering tends to pull the kidney down. The stomach presses on the left kidney and the liver on the right. This pressure results in fat absorption, and this part of the support is taken away. The pressure of the liver and stomach on the transverse colon tends to sharpen the angles at the flexures and interfere with function."

This is a beautiful theory, but it does not coincide with the observations of Smith and Butler, which seem to show that many of the signs of visceroptosis (malnutrition, lack of fat, etc.) precede the establishment of the peculiar body habit. Osgood,[9] in discussing the signs and symptoms which go with visceroptosis, says it is often difficult to distinguish cause and effect, "to know which is the cart and which is the horse." That Goldthwait in his theorizing was probably driving a reversible engine which would go equally well either way is shown by a quotation from another article.[10] Here he says:

"If now for any reason the colon has a free mesentery, it not only no longer furnishes support for the stomach, but since it is attached by the mesocolon to the stomach the result must be, when the body is erect, that the colon sags downward, and must, at the same time, drag the stomach downward as well. This drag upon the stomach is still further increased and the supporting structures still farther stretched by the fact that, since neither the stomach nor the colon under such conditions can be fully evacuated, the actual weight and consequent downward drag of these organs must be greater than normal. The result of the continuance of this downward drag must be the gradual loosening or interference with the organ pressed upon and the absorption of the retroperitoneal fat. With the weakening of these lower supports, the drag is thrown more and more upon the diaphragm through the cardiac attachment, and, since the chief ligament for the support of the diaphragm is the cervical fascia with its expansion through the right side of the pericardium, the abnormal drag upon the diaphragm naturally results in abnormal strain upon this ligament with the natural unconscious attempt to relieve the strain. To accomplish this, the trunk is thrown backward at the waist, while the head and cervical spine are thrown forward, in which position the cervical fascia is relaxed. The results of such postures are the sternum and the ribs are lowered so that the narrow flat chest results, etc."

The latter view is, I think, more in keeping with the sequence of development of the conditions that obtain in visceroptosis.

A ROENTGENOLOGIST'S VIEW

In the September, 1925, number of the *American Journal of Roentgenology and Radium Therapy* is an article by John L. Kantor,[11] of New York, on "The Low Cecum," which, I think, fairly well represents the views of roentgenologists on the subject. The opening sentence of this article is:

"Despite the fact that low placement of the cecum is the most common anomaly of the colon, the clinical significance of this condition is probably by no means well known to the Practicing Physician."

Further, under the heading, Anatomical Considerations, he says:

"As a result of the embryologic process known as 'descent,' the cecum, when its position is normal, comes to rest in the right iliac fossa. If the process of descent continues unabated, the cecum progresses into the pelvis. Normally the cecum is unattached, whereas the descending colon is fixed to the posterior abdominal wall. When the ascending colon is provided with a mesentery, the mobility of the cecum is correspondingly increased (cecum mobile)."

His study is based upon 100 unselected cases encountered in 554 consecutive private patients complaining of gastro-intestinal symptoms. The incidence of low cecum was 18.1 per cent (100 in 554 cases). Of these, 79 per cent occurred in women, and 54 per cent in asthenics. The symptoms he divided into two groups: Systemic (those of so-called auto-intoxication), nausea, vomiting, headache and depression, and local, colicky pains in the right lower quadrant. The symptoms were not constant and were influenced by strains, mental, physical, traumatic or emotional, and by fatigue or exhaustion. One-fifth of the cases had had appendectomies without relief and probably many more had had operation offered them. In patients with high ceca only 10 per cent had had appendectomies.

As to the significance of the low cecum, he says:

"Anomalies of the proximal colon, although they may also be associated with constipation, seem to be quite characteristically allied to general systemic upsets (so-called auto-intoxication) such as vomiting and headaches. What the exact mechanism may be is still a matter of doubt. Thus I have so far been unable to prove, by the statistical method, that either cecal or ileal stasis has any causative influence whatever on the production of symptoms in cases of low cecum."

SOME SURGICAL IDEAS

The typical visceroptotic is of slender build, with poorly developed muscles, little body fat, a sallow skin, drooping shoulders, flat chest, slender abdomen, relatively broad hips and a tendency to protuberance of the lower abdomen, though this may not be marked in young subjects. He, or more often she, is extremely neurotic, often psychasthenic to a marked degree. There is present indigestion of a flatulent type, often associated with nausea and vomiting, constipation and abdominal pain which may be in the epigastrium, in the right hypochon-

drium, or, more commonly, in the right iliac fossa. A careful physical and roentgenologic examination of these individuals will show that some or all of the abdominal organs have a low position.

The peculiar body habitus has, by many writers, been ascribed to be the cause of the low position of the abdominal viscera, as have also the muscular and general tissue weakness, the nerve weakness and the constipation. By some (Rovsing,[12] Beyea,[13] Coffey[14]) the low position of the stomach has been held accountable as the chief cause of symptoms, and efforts made to relieve the symptoms have been by operations directed toward an elevation of the stomach. Others consider a low distended and diseased colon with an attendant intestinal stasis the chief offender. These (Lane,[15] Bloodgood[16]) have developed the short-circuit operations or practiced excision of greater or less amounts of the colon. Cases of gross dilatation of the duodenum, with all the signs and symptoms which are usually associated with general visceroptosis, and which were relieved by duodeno-jejunostomy, have been reported (Vanderhoof[17]).

In 1912 Ransohoff[18] said that insufficient fixation of the cecum and ascending colon was the most important factor in adult visceroptosis. More recently Waugh[19] and Small[20] have advanced the same idea, offered an explanation of why such insufficient fixation was productive of symptoms, and each has developed an operation for the correction of the abnormality. The latter two claim that, because the attachments of the right side of the colon are so intimately associated with the attachments of the pyloric end of the stomach, the duodenum and right kidney, its congenital deficient fixation results in a marked interference with the supports of these organs and a consequent interference with their function; also that, in cases with deficient fixation, there are commonly present peritoneal bands connecting the right colon on the one hand with the stomach, duodenum, gall bladder and parietal peritoneum on the other, and that, on account of the lack of sufficient leverage, the colon is handicapped in its normal function; that it becomes overloaded, loses its tone, gives rise to toxemia from intestinal stasis and, by pulling on its peritoneal attachments and dragging the superior mesenteric artery across the third portion of the duodenum and compressing it against the aorta and spine, gives rise to symptoms which may be associated with the colon itself, the stomach, gall bladder or duodenum. They even lay great stress upon this as an etiological factor in gastric and duodenal ulcer.

In many, I think the majority, of the cases presenting symptoms which we commonly associate with visceroptosis, a careful examination will show that there is a loose attachment of the ascending colon. This is true in some individuals in whom a general visceroptosis cannot be demonstrated; that is, all the symptoms of visceroptosis may be present with the right side of the colon the only ptotic organ. That, in some cases, the right side of the colon may be low (and the other abdominal organs for that matter) and the individual appear in perfect health is no argument that the ptosis of these organs is never the cause of the symptoms. It would be just as logical for a person to argue that war was not dangerous because he had been through two or three battles and had not been wounded. A person may have a leaky heart valve and go for years without showing any symptoms. His heart, however, may be working close to the limit of its lessened reserve. Then, because of a weakening from age or from added work, due to some slight extra physical or mental strain, the break in compensation comes. So, too, do I believe the abdominal organs, working unduly hard against mechanical handicaps may appear normal for years, then have a break in compensation. This would explain the late development of symptoms from a congenital mechanical abnormality.

I am most thoroughly in accord with the view of Ransohoff, Waugh and Small that deficient fixation of the right colon is the most potent factor in the production of the symptoms and degenerative physical changes that accompany visceroptosis. Just how these symptoms are produced I am not sure. In the majority of cases, a dilatation of the duodenum can be demonstrated. The roentgenogram may not show it, but, with manipulation under the fluoroscope, it may be made out. Often, too, during the examination a to and fro motion of the opaque media in the duodenum can be seen, suggesting an interference with function here. This, together with the facts that ileal and cecal stasis, can often be demonstrated in individuals who do not show signs of intestinal toxemia and that many cases of duodenal dilation, in which were present constipation and toxemia, have had both relieved by a duodeno-jejunostomy, have led me to the conclusion that the toxemia of visceroptosis and perhaps even the colonic stasis are due not so much to the colon itself as to duodenal dysfunction.

The histories of visceroptotic patients will

often show that the subjects were never very strong, and that many of them were constipated and were subject to intestinal upsets in childhood. The only abdominal ptoses that are common in childhood are those associated with the colon; and adult visceroptosis with characteristic signs and symptoms occurs, according to statistics, only a little less frequently than does the persistence of the primitive mesocolon on the right side. These facts and others brought out in this paper have led me to believe that visceroptosis develops not as the result of indigestion in childhood, not as the result of malnutrition, not as the result of a weak and unstable nervous system and not as a result of a peculiar body habit, but, on the other hand, that the individual has indigestion in childhood, has malnutrition, is neurasthenic and develops his peculiar type of body because of his visceroptosis, the main factor of which, in many cases, is deficient fixation of the right colon.

THERAPY

That the treatment of visceroptosis by posture, mechanical supports, gymnastics, attention to diet and intestinal hygiene and psychotherapy is productive of good results in many cases I am free to admit. In many cases, however, it is so irksome and time-consuming that the patients will not carry out the treatment. The economic aspect, too, as regards the time necessary for the treatment must be considered.

Because of the strongly adverse opinion of the surgeons of this country against the operation of cecopexy, so-called due, I think, to the unfavorable results which followed the early (to my mind, irrational and unanatomical) operations, it was with a great deal of hesitancy and reluctance, and only after very careful consideration that I took up this work two years ago. The results have been most gratifying, in some instances truly startling. I have now 15 cases operated upon six months or more ago. Following the operation, I have seen, in a comparatively short space of time, an habitual constipation and indigestion disappear, a sallow skin take on the pink glow of health, nutrition improve and nervous symptoms disappear, with the individual veritably transformed from a psychasthenic, constipated, dyspeptic, undernourished, morose semi-invalid to a happy, carefree, well nourished, healthy person. I have seen this not once or twice or three times, but in nearly all of the cases upon which I have operated. In only one instance were the symptoms not markedly improved. A roentgenogram of this patient, taken four months after her operation, showed the cecum in its original low position in the pelvis. Roentgenograms of other patients, all of whom have been markedly benefited, taken from six months to a year after their operations show the cecum in a relatively high position in the right iliac fossa.

CONCLUSIONS

(1) The primitive mesocolon on the right side fails of fusion to some extent in one in every four or five human beings.

(2) The condition is more common in females than in males.

(3) The condition may be present and not cause symptoms.

(4) It is, however, the most important factor in the production of the symptoms usually attributed to visceroptosis.

(5) The persistent primitive mesocolon can be obliterated, the colon fixed and symptoms relieved in many cases by a comparatively simple and safe surgical procedure.

BIBLIOGRAPHY

1. Glenard: De l'enteroptose, Paris, 1885.
2. Treves: The Anatomy of the Intestinal Canal and and Peritoneum in Man, 1885, p. 55. Reported in Gray's Anatomy, eighteenth ed., p. 1304, 1910.
3. Bryant: Visceroptosis; Normal Incidence. J. A. M. A., 72, p. 1400, 1921.
4. Smith: A Study of Children with Reference to Enteroptosis. J. A. M. A., 58, p. 385, 1912.
5. Butler (quoted by Smith): J. A. M. A., 55, p. 2279, 1910.
6. Moody, Van Nuys and Chamberlain: Position of the Stomach, Liver and Colon; Results of a Roentgenologic Study in Six Hundred Healthy Individuals. J. A. M. A., 81, p. 1924, 1923.
7. Harris and Chapman: A Clinical and Roentgenographic Study of Gastroptosis. J. A. M. A., 79, p. 1832, 1922.
8. Goldthwait: Orthopedic Principles in the Treatment of Abdominal Visceroptosis and Chronic Intestinal Stasis. Surg. Gynec. and Obst., 16, p. 587, 1913.
9. Osgood: What Evidence Can Be Brought Forward to Show That Visceroptosis Is Anything More Than a Variation from an Anatomic Norm., etc. Amer. Jour. Orthop. Surg., Sept. 1916.
10. Goldthwait and Brown: The Recognition of Congenital Ptosis in the Treatment of the Badly Poised and Poorly Nourished Child. Amer. Jour. Orthop. Surg., 9, p. 253, 1911-12.
11. Kantor: A Clinical Study of Some Common Anatomical Abnormalities of the Colon; II. The Low Cecum. Amer. Jour. Roentgen. and Rad. Ther., 14, p. 207, 1925.
12. Rovsing: Ann. Surg., vol. 57, 1913.
13. Beyea: Amer. Jour. Gastro-Enteral., 1, No. 1, 1911.
14. Coffey: Surg. Gyn. and Obst., 15, p. 365, 1913; and J. A. M. A., 82, p. 900, 1923.
15. Lane: The Operative Treatment of Chronic Intestinal Stasis. Frowde, London, 1918.
16. Bloodgood: Surgical Measures for the Relief of Abdominal Symptoms Due to Ptosis of the Stomach and Colon. Amer. Jour. Gastro-Enterol, Philadelphia, No. 11, 1912.
17. VanderHoof: Dilated Duodenum with Special Reference to Chronic Duodenal Obstruction in Visceroptosis. J. A. M. A., 69, p. 510, 1917. And VanderHoof and Doris: Chronic Occlusion of the Duodenum in Visceroptosis. Virginia M. Monthly, 1, p. 591, 1923.
18. Ransohoff: The Operative Treatment of Gastroenteroptosis. Boston M. and S. J., 167, p. 347, 1912.

19. Waugh: The Morbid Consequences of a Mobile Ascending Colon. Brit. J. Surg., 7, p. 343, 1920.
20. Small: Developmental Errors in Fixation of the Ascending Colon. S. M. J., 17, p. 853, 1924.

1420 N. Ballinger Street.

DISCUSSION (Abstract)

Dr. K. H. Aynesworth, Waco, Tex.—I began the study of this subject before 1914, and in 1914 read a paper on the anatomy of the colon from the embryological standpoint. This paper was inspired by my failure to relieve patients who came to me suffering from what was then diagnosed as chronic appendicitis. At about the same time the literature contained a contribution now and then which reported dissatisfaction with the surgical treatment of painful conditions in the right side of the abdomen. Lane, in England, emphasized the importance of stasis of the intestinal tract, and Willms, in Germany, the association of mobile cecum with this condition. Lane developed the theory that constricting bands attached to the intestines and kinks were acquired; Willms observed the presence of bands and kinks, but advised operations on the dilated or displaced cecum.

I am of the opinion that the defects of embryological development are the sole cause of the condition described, and that an accurate understanding of how the colon and duodenum are attached to the posterior abdominal wall and the positions in the normal individual are essential. It is an easy matter to understand how perverted physiology of the intestinal canal may produce the symptoms which arise.

I think that mobile colon is a congenital defect and that it is of frequent occurrence. Statistics show that, irrespective of age or physical form, about 20 per cent of all individuals examined have abnormal colons. My own observations confirm this view. It is seldom the cause of disease, but when it is the symptoms are very clear and distinct and easily recognized. Medical treatment including adjunctive measures in the early stages of breakdown is often helpful. In the fully developed patient surgery alone or combined with appropriate medical measures is the treatment of choice. My results are similar to those reported by the essayist.

It seems reasonable to conclude that the physical condition of the patients and the symptoms which they present are the result of mobile right colon, including its effects upon the duodenum, etc., rather than the cause. The surgeon should be an embryologist.

There are patients suffering from colon disease which should not be operated upon. Among the contraindications, I shall mention the most important: those who are beyond 50 years of age, especially if they have suffered from youth; those who have concomitant diseases of the heart, lungs, kidneys, etc. A broken down nervous system is usually beyond repair, even though the orginal cause of the trouble lay in the intestinal tract. Colopexy is an operation for those in youth and middle age before the results of long continued toxemia upon the vital centers have become irremediable.

Dr. A. B. Small, Dallas, Tex.—The essayist called attention to the fact that the primitive mesocolon is present in a larger percentage of instances on the left than on the right. The difference in the importance of the two sides is readily seen in the difference in their structure relationships.

The right mesocolon is simply a duplicate fold of peritoneum to which the gut is attached while the process of rotation is taking place, and serves as a housing in embryo for the circulation to reach the gut wall from the superior mesenteric blood supply. It is poorly constructed to act as a suspensory ligament, which part it must play in the event it does not become fused but persists in its entirety. By some caprice of nature, this membrane, which is due to become obliterated, fails in about 20 per cent of individuals to fuse with the retroperitoneal fold covering the psoas muscle, and therefore fails to become fastened to the posterior body wall, giving us a mobile ascending colon which, under certain conditions, has a surgical significance. On account of its unique anatomical relationships a mobile ascending colon is capable of giving rise to a wider range of symptoms than many other physical deformities whose demands on our profession for correction have resulted in the development of a high state of surgical proficiency.

Let me make this next point quite clear: We are not dealing with the visceroptotic. The visceroptotic may always be found with a loose ascending colon, while the person with a loose ascending colon may never have visceroptosis. This may sound illogical.

In 1849 Rokittanski, the great Vienna pathologist, suggested that compression on the duodeno-jejunal junction by the superior mesenteric artery was responsible for gastric and duodenal dilatation, particularly dilatation of the third stage of the duodenum. Had this autopsy student lived in the present day of abdominal surgery with its routine roentgen ray interpretations, he no doubt would have found the cause for the drag on the radix of the duodenum, almost without exception, a mobile ascending colon, as Bloodgood did (*Annals of Surgery*) three score years later. Numerous authors commented on gastric and duodenal dilatation, usually confusing it with visceroptosis, following Rokittanski's article, but none advanced beyond the position taken by him. It is certain that Glenard failed to shed any light on the subject by his assumption that the radix of the duodenum is physiological, designed to retard the duodenal contents. Who can say that such a specification was not in the original architectural plans? We are not trying to pick a flaw in this part of the structure which evidently functions in a satisfactory manner when the designs have been complied with in other parts of the building. The ascending colon, instead of being anchored to the posterior body wall, a position which must be normal, since 80 per cent are found there on a base with lateral dimensions, in a certain percentage of cases, has a linear attachment which permits the gut to drift to the medial position and when loaded to swing low in the pelvis. In this altered position in the body cavity, the mesenteric leaf is put on a strain, the blood vessels in its folds are made tense, and when kept this way for an indefinite period the angle described by the superior mesenteric artery on one side and the abdominal aorta and spinal column on the other is made more acute.

The duodeno-jejunal junction lies in this angle. As the space is narrowed down by the continued pressure incident to the pull by the loaded gut in the pelvis, the physiological radix is transformed into a pathological trap. There is a rational way to enlarge the angle beneath the radix, or open the jaws of the vice whose grip causes chronic duodenal ileus, namely, drift the mobile colon back onto the shelving portion of the psoas muscle and anchor it there, the operation known as colopexy.

EYE, EAR, NOSE AND THROAT

CAVERNOUS SINUS THROMBOSIS: REPORT OF A CASE*

By D. C. MONTGOMERY, M.D.,
Greenville, Miss.

Shortly before the beginning of the European War, Langworthy, of Iowa, endeavored to gather the scattered data concerning infections of the cavernous sinus, and to make a complete tabulation of the cases of thrombosis of this sinus which had been published up to that time. He carefully examined the literature and sent out a questionnaire to members of the American and Western Surgical Associations. From the question letters sent out, which means mostly unpublished information,

"Twenty-nine cases were reported of septic thrombosis, with recovery in three cases (Sholtz, Kanavel and Halstead), or 9.6 per cent. Of these cases of recovery, one from the ear recovered through energetic and thorough aural surgical procedures alone, that is, radical mastoid and jugular ligation operation. Another, neck infection, recovered through local neck drainage, and the third complicating an ethmoid operation with syphilis, recovered on expectant, purely medical treatment. A direct operation was not attempted by any one of the 21 general surgeons upon whose data part of this report is based."

In 44 cases of septic thrombosis selected from the index of literature, three (Johnson, Adair-Dighton and Bircher) recovered, or a percentage roughly of seven.

"Jackson also gives a percentage of recoveries of about 7, while Dwight-Germain places the recoveries in a total of cases looked up as 7.33 per cent."

From the literature and private sources this author obtained six instances where the diagnosis of septic cavernous thrombosis was made and Nature was able to overcome the infection so that the patient survived. In these instances attention was given solely to the original infecting focus and not to the cavernous sinus itself. Of the seven further attempted operations of any kind to drain the sinus by direct surgical procedure, Bircher, Voss, H. Knapp, Dwight and Germain, C. A. Ballance, Ballance and Hobhouse, and Mosher, all have failed to accomplish the purpose, and two at least we know failed even to get to and open the sinus toward which the operation was directed.

Three possible routes by which the sinus may be reached have been proposed, namely, the Hartley-Krause gasserian ganglion route through an osteoplastic resection on the side of the skull; Mosher's proposed anterior orbital exenteration and chiseling through the orbital plate of the great wing of the sphenoid; and finally Langworthy's own procedure.

Luc, of Paris (1905), came to the conclusion that the cavernous sinus should be approached through the maxillary antrum on the opposite side of the head, and upon the cadaver he was able to open the sella turcica and penetrate the sinus without injuring the important structures.

The rarity of the condition of thrombosed cavernous sinus may be judged when we hear that since its recognition by Herman Knapp in 1868 not more than 300 cases had been reported up to the close of the Great War.

The thesis which Dorland Smith presented to the American Ophthalmological Society in 1918 took up the work where Langworthy had relinquished it, and found 10 additional cases to which he added five from his own experience. All his personal cases were fatal and in only one was autopsy permitted; no surgical intervention is mentioned; indeed no treatment of any kind is outlined. In the outline of the 10 cases from the literature there are mentioned no curative measures. Commenting upon the literature, this author states:

"That the process is always fatal if the thrombus is infected and is not drained. If the symptoms arise simply from an obstructing sterile clot by extension from the sigmoid sinus, and this clot does not become infected because of an early operation on the sigmoid, recovery may be possible."

The total of recoveries in nearly 300 cases amounts to 23, about 7 per cent. Quoting Smith further,

"On the assumption that the clot in the sinus was not infected, and considering the great number of observers, the fragmentary character of many of the reports, and the possibilities or inaccuracies and of errors in diagnosis, we are forced to the conclusion that thrombosis of the cavernous sinus is practically always fatal if the thrombus is infected and is not drained."

Four cases of cavernous sinus thrombosis were seen in a single year (1919) by the English otologist, T. Ritchie Rodger. One of these followed a frontal sinusitis, a most unusual etiology, of which only two other examples are on record. This observer believes that the anastomosis is

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., Nov. 9-12, 1925.

so free between the right and left sinuses by means of the circular sinus, that thrombosis on both sides is probably the rule; in most of the cases that have come to autopsy, this bilateral involvement was in evidence. He believes that this is our greatest obstacle to direct successful attack on the sinus, and doubtless the explanation for most of our failures. This author has no methods of attack to suggest, but wishes to lay emphasis upon preventive and conservative treatment. He strongly recommends the placing of all otitic cases out of doors as is done for prolonged suppuration of the bones, believing the patient's resistance will be strongly increased, and the danger of sinus thrombosis lessened.

A case described by Blake, of New Haven, is chiefly notable because of the unusually thorough autopsy which he was enabled to make. The subject was an Italian child aged three and one-half years, and the anatomic diagnosis was otitis media causing infected thrombi in both cavernous sinuses, and in the left lateral, straight and longitudinal sinuses, and acute cerebral meningitis.

The case reported by Major Goldthwait, of the Army Medical Corps, presents several interesting features. The patient was 22 years of age and came under observation for a running ear for which the simple mastoid operation was performed. This was on July 15, and uneventful convalescence followed until July 22 when the characteristic symptoms—chill, rise of temperature, etc.—followed. On July 24 there was definite swelling of the lids, with an area of orbital density observed roentgenologically. Upon the symptoms and blood count a diagnosis of cavernous sinus thrombosis was made, and the mastoid cavity opened; granulations curetted; attic opening enlarged as far as possible and plate underlying dura, from tegmen tympani to posterior angle removed. The lateral sinus was treated in the usual way, and the patient returned to the ward. The eye-swelling was temporarily retarded, but soon increased and a drain was inserted in the orbit following incision of the tarso-orbital fascia on the right. The mastoid wound progressed well, but July 31 there was a severe pain in the back and head and rapid exacerbation of symptoms, the patient dying August 5, 21 days after the mastoid operation was performed.

From the necropsy findings the author is inclined to believe that the direct approach to the cavernous sinus by the sphenoidal route would have been more feasible than any other. The autopsy showed that the pus must have burrowed through the temporal bone, following along the course of the carotid artery, then eroded its way through the apex of the temporal bone where an irregular area of necrosed bone about ten millimeters by five millimeters was found. At this point the infection had evidently entered the cavernous sinus directly. This accounts for the failure to find the clot in the lateral sinus when this was opened and drained in two directions. The existence of this fistulous tract was not evident at the time the mastoid was operated, so it would not have been possible to have followed this tract in bone removal as in Bircher's case. Further erosions evidently occurred during the period of remission of symptoms, July 26 to August 1, and then culminated in meningitis when the dura barrier gave way. The course of the infection in this case was very definitely shown to have been through the substance of the bone instead of by a venous transmission, as occurred in most other reported cases.

The case reported by Ralph D. Sproule, of Milwaukee, last year was of dental origin, being probably only the third on record in which this etiology has been determined. The patient, who was a woman of 30, had had a chronically discharging ear for eight years previously, but the autopsy findings definitely proved that this was not the source from which the cavernous sinus was infected. The symptoms began to be manifested very soon after the extraction of a right third lower molar, and death took place about six weeks after the extraction. There was no attempt at surgical intervention, but anti-streptococcic serum was given three days before death without benefit. At autopsy the mastoid cells and the sphenoidal sinus were explored and showed no pathologic lesion. The cavernous sinus, the circular, and infra-petrosal sinuses on both sides, together with the basilar and sigmoid sinuses showed, when opened, a yellow gelatinous material having the appearance of organized clot. The pituitary gland and third nerve on the right side were surrounded by a pus-like exudate.

Though he has given no case reports, the paper read before the Pennsylvania State Medical Society by deSchweinitz is of great interest. Though he purposely avoids discussion of treatment, he has this to say:

"Although the prospects of operative interference are not brilliant, one or other of the various methods which have been devised for an approach to the sinus region ought to be taken into consideration as affording at least some prospect of relief, inasmuch as all cases of septic cavernous thrombosis (there are few exceptions) have proved fatal. Dorland Smith, after his conscientious study of the whole matter, concludes that surgical measures are indicated, and that the cavernous sinus should be drained if a definite diagnosis can be made out before the patient becomes too septic. Drs. Chisholm and Walker, in an analysis of 12 cases, observed one case of recovery in these circumstances without operation, and they also point out that if the examination of the spinal fluid reveals the presence of meningitis, mere drainage of the cavernous sinus is not sufficient, and that if the spinal fluid is clear there is some chance of recovery without operation."

The most recent case report of cavernous sinus thrombosis is that of John Phillips, of the Cleveland Clinic, which followed an acute otitis media, the infection probably passing through the superior petrosal sinus which "may occur with or without mastoid involvement." Curiously enough the three other cases seen by this writer have been of rare etiology, two from the maxillary sinus and one following extraction of an infected tooth. He states that one of these patients recovered, but does not specify which case is indicated. No surgical treatment was apparently given in any of them, as he specifically mentions that "surgical treatment has been attempted, but has so far been unsuccessful."

In addition to these six cases, notes of which have been given here since the publication of Smith's paper in 1918, other cases have been reported by Woodburn, Hemmeon, Key-Aberg, Maybaum, Reese, Kernan, Robinson, Stegman, Weber, and some 19 cases from foreign literature, making in all some 36 cases.

Of the 17 cases reported in this country, one recovered. In none of these cases were operative measures on the cavernous sinus attempted. The original focus of infection was eliminated as thoroughly as possible, and supportive treatment given subsequently where symptoms of cavernous sinus appeared.

Nine cases followed otitis media: two, infection in the nose, a carbuncle and an abscess; one, a nasal sinus; one, a peritonsillar abscess; one, infected wounds of neck; and one of dental origin was described by Sproule, who could find only two other cases on record. In one case in a pregnant woman, no cause was given, and she recovered.

CASE REPORT

J. H., aged 6, came to my office February 25 complaining of pain in the left ear which had been present for two days. One week previously he had had a mild attack of influenza, which did not confine him to bed, and he was referred to me by his family physician because of his earache. Examination showed the patient to be a well developed normal child.

The left ear showed a congested bulging drum which was incised freely with escape of pus. Culture taken from the ear showed a Staphylococcus aureus. The usual treatment was advised and his mother was instructed to bring him back to the office the following day. During the following 48 hours drainage was free. There was no elevation of temperature, and the patient was apparently running the ordinary course. On February 28 he complained of headache and his temperature suddenly rose to 104° during the afternoon. He was then sent to the hospital and x-rays of the mastoid and a blood count were advised. X-ray of the mastoid showed no breaking down of cells. Leukocytes were 13,000. Blood culture was also taken. Urinalysis was negative. On March 1 his temperature dropped to 100, and he had a fairly good day. Temperature rose to 101°, the pulse to 100 by afternoon, and he was somewhat irritable and restless. The laboratory reported his blood culture positive for Staphylococcus aureus. Urinalysis showed some granular casts. Leukocytes were 15,000, and polymorphonuclears 80 per cent. Discharge from the ear was very free and thick, and there was some tenderness over the mastoid, though it was not marked. Examination of the ear showed a good free opening in the drum, with thick pus pulsating through the opening. There was no drooping of the posterior superior wall and examination of the eye grounds was negative.

On the morning of March 2 the mastoid was opened and found full of pus. Complete exenteration of all cells was done, and the opening in the tympanum enlarged. Exposure of the lateral sinus and dura occurred at this time, but they appeared to be healthy. No granulation was found over the sinus. The patient was returned to his room in good condition. Up to March 6 the temperature was between 102 and 104°. During this time the patient was restless, irritable, and slept very little. There was a very free discharge of pus from the mastoid wound. Examination of the eye grounds was again negative, and urinalysis was negative.

Blood count on March 5 showed a leukocytosis of 26,000, with 84 per cent polymorphonuclears. Blood transfusion from the mother whose blood was found to be compatible was begun on March 6 and 12 ounces were given the patient with apparent improvement. This was repeated three times during the next 10 days. On March 7 the temperature dropped to 99° and did not go over 100° until March 9, when the patient had a chill, then a rise of temperature to 106°, followed by a drop to 99° by evening. On March 10 he had another chill and elevation of temperature to 106°.

The patient looked toxic, was very restless, his pulse was rapid, and at times very weak. Examination of the eye grounds was negative. The pupils were equal and reacted to light normally. There was still much discharge of pus from the mastoid wound. Physical examination was negative. Crowe's sign was positive. He had 23,000 leukocytes, 60 per cent hemoglobin, and 3,500,000 red blood cells.

Lateral sinus thrombosis was diagnosed and the patient was sent to the operating room. Under ether anesthesia the lateral sinus was exposed and a small extradural abscess over it was found. The internal jugular vein was ligated above the facial vein and cut across. The lateral sinus was opened and the clot removed until free bleeding was achieved from both ends of the sinus. The sinus was packed and the patient sent back to bed. His pulse was very rapid, but his general condition fairly good. During the next two weeks his temperature ranged from 100 to 103°, gradually dropping until, on March 28, it went to normal and remained so for two days.

At this time there was noticed a little fullness or puffiness of the lid of the left eye. Examination did not reveal anything particularly wrong. The incision in the neck had healed nicely, and the mastoid wound showed very little drainage. The middle ear was dry, and there was no pus in the canal. One small abscess had developed in a lymphatic gland at the sterno-clavicular joint, and another under the lower jaw, which were opened and drained.

Examination of the nasal sinuses was negative; also x-ray examinations. The left optic disc showed a little blurring of the margins, and there seemed to be some little less abduction of the eyeball. The right eye was normal.

The patient had been getting along nicely, sleeping better, playing with toys, and was more interested in what was going on around him. His appetite was very good, leukocytes had dropped to 20,000, erythrocytes had risen to 4,250,000, and hemoglobin was 70 per cent.

On April 1 the temperature began to fluctuate again and ranged between 99° and 101° during the next two weeks. On this day the left eyelids began to swell rapidly. There was marked exophthalmos, the eye was fixed and immobile, the pupil dilated and fixed and there was chemosis of the conjunctiva. Forty-eight hours later the right eye began to swell. The exophthalmos in this eye was not so marked as in the left,

and never became so bad. Ophthalmoscopic examination showed mild optic neuritis of both eyes. There was marked fullness of the retinal veins, and no abduction in the left eye at all. The patient kept this eye covered constantly. Vision was markedly impaired. Cavernous sinus thrombosis was diagnosed, and the condition considered hopeless. The parents were told of the grave nature of the disease and that nothing could be done. However, the patient continued to hold his own during the next few days, the temperature fluctuating between 100 and 102°, the pulse running from 100 to 110. The exophthalmos became more marked in the left eye and remained the same in the right. At this time the patient began to vomit a great deal, and duodenal feeding was resorted to with very satisfactory results. The patient was more or less restless, very irritable and cross. He began to lose weight rapidly, was unable to sleep well, and his condition was very grave.

Having to deal with very intelligent people in this case I decided to lay the matter before them fully and suggest that an attempt be made to drain the sinus through the orbit, acquainting them with the probable outcome of surgical interference. As they felt that the condition was hopeless and that I could not do much harm, they agreed to the operation.

On April 12 under ether anesthesia I enucleated the left eyeball, and following somewhat Mosher's suggestion I entered the lower and inner margin of the sphenoid fissure. Hugging closely to the body of the sphenoid with a dull curette, I pushed backward, entered a pocket of pus and evacuated about one-half teaspoonful. Not knowing whether I was in the cavernous sinus or not, but feeling that I had accomplished something, I decided to put in a drainage tube and await developments. The result of this was very gratifying. The right exophthalmos began to subside immediately and the swelling in the left eyelids began to go down. Drainage from the left orbit was free and culture showed the same organism previously obtained from the mastoid and blood stream, the Staphylococcus aureus. The choked disc in the right eye cleared up very rapidly. The temperature began to go down so that on April 24, or at the end of twelve days, it was normal again, and remained absolutely so for seven days.

Examination of the patient showed only slight blurring of the disc margins of the right eye, the globe freely mobile, pupil reaction normal, and no exophthalmos whatever. Swelling of the tissues of the left orbit was gone and the lids were about normal. Distention of the veins of the forehead was still present, but not quite so marked as previously. The mastoid wound and neck incision were completely healed, and there was no pus in the middle ear. The temperature was 98.6; and pulse 80-90.

The blood picture showed leukocytes 11,000, a drop of 10,000; polymorphonuclear 62 per cent; 4,500,000 red cells; and 75 per cent hemoglobin. Blood culture was negative, urinalysis was negative, and physical examination was negative. The appetite was good. The patient slept well, and was anxious to get up. He was again interested in his toys, etc., and begged to go out into the yard. At the end of a week he was allowed up in rolling chair and was wheeled into the yard. He was getting along nicely and there was every reason to believe that the improvement would continue. However, on May 3, the temperature, which had been normal, rose to 102°, and for the next week was 99° in the morning and 102° in the afternoon. The patient began now to complain of headache and constantly kept an ice bag on his head. His appetite was poor; he refused to eat or drink anything. His pulse rate was 120, and he was again restless and irritable.

Examination showed a small tender area at about the vertex of skull, but no swelling. The eye ground was negative, and there was no discharge from the left orbit. In the mouth there was some small ulceration in the cheeks and hard palate. The gums were bleeding slightly. The bowel movements showed some bright red blood. The heart and lungs were negative. There was a quantity of pus in the urine, culture of which showed Staphylococcus aureus. Duodenal feeding was again used with good results. Orange juice in large quantities was given in this way.

On May 19, examination of the skull showed a small swelling at the vertex and fluctuation. On incision about a teaspoonful of pus was evacuated, and with a probe a small area of necrosis in the bone was discovered. Drainage was instituted without much improvement. A few days later another swelling developed lower down in the skull and incision disclosed pus and necrosed bone. The patient's condition remained about the same, when there was a sudden rise of temperature to 105°, followed by a drop to subnormal, 97°. On May 31 it rose to 105° again, the patient became stuporous and gradually went into coma. The leukocytes now had risen to 26,000, and the urine showed pus and granular casts. Blood culture taken about five days previously remained negative. Lumbar puncture was done and showed cloudy fluid under tension. Analysis of the spinal fluid showed cell count of 450, with 85 per cent polymorphonuclears. No organism was found, although culture later showed Staphylococcus aureus.

The patient died June 1 of Staphylococcic meningitis, seven weeks after the development of cavernous sinus thrombosis, and six weeks after drainage through the orbit. No autopsy was permitted.

The treatment used in this case, other than a thorough surgery of the underlying cause, mastoidectomy and control of the lateral sinus thrombosis, consisted as outlined above of blood transfusions, one given with gentian violet, duodenal feeding, supporting measures when indicated, and an attempt to drain the sinus through the orbit. Unfortunately an autopsy could not be obtained to determine this question absolutely, but in view of the immediate good results I feel that something was accomplished to this end.

In conclusion, I wish to say that in spite of the usual outcome in this case, the fact that the patient managed to survive the operation for six weeks, inclines me to believe that operative interference should be undertaken in every case that is not *in extremis*. Only by such interference can we hope to reduce the mortality rate of 93 per cent, which is probably higher than this in septic cases. Of the various operations suggested it seems to me that either the sphenoidal route of Langworthy, or orbital route of

Mosher, offers us the best methods so far devised of attacking this sinus.

BIBLIOGRAPHY

Langworthy, H. C.: Anatomic Relations of the Cavernous Sinus to Other Structures, with Consideration of Various Pathologic Process by Which It May Become Involved. Ann. Otol. Rhinol. and Laryngol., 25, p. 554, 1916.
Smith, Dorland: Cavernous Sinus Thrombosis with Notes on Five Cases. Arch. Ophthal., 47, p. 482, 1918.
Rodger, T. R.: Cavernous Sinus Thrombosis; Notes on Four Cases. Proc. Roy. Sec. Med., 14; Sect. Otol., 19, 1920-1921.
Blake, E. M.: Cavernous Sinus Thrombosis Complicating Meningitis: Microscopic Studies. Amer. Jour. Ophthal., 4, p. 16, 1921.
Goldthwait, R. H.: Thrombosis of Cavernous Sinus of Otitic Origin. Military Surgeon, 45, p. 430, 1921.
Sproule, R. P.: Cavernous Sinus Thrombosis with Report of a Case of Dental Origin. Wisconsin Med. Jour., 22, p. 587, 1923-24.
DeSchweinitz, G. C.: Thrombosis of the Cavernous Sinus. Atlantic Med. Jour., 27, p. 555, 1923-24.
Phillips, John: Thrombosis of the Cavernous Sinus. Surgical Clinics N. A., 5, p. 915, August, 1924.
Patton, W. T.: Double Cavernous Sinus. Thrombosis Following Obscure Mastoiditis. Laryngoscope, 26, p. 1926, 1916.
Woodburn, J. J.: Septic Thrombosis of Cavernous Sinus. Med. Press and Circular, N. S. 113, p. 13, London, 1922.
Crans, C. G.: Thrombosis of Cavernous Sinus. Laryngoscope, 26, p. 1283, 1916.
Day, E. W.: Treatment of Lateral and Cavernous Sinus Thrombosis. Atlantic Med. Jour., 27, pp. 560-564, 1924.
Hemmeon, J. A. M.: A Case of Cavernous Sinus Thrombosis of Otitic Origin, etc. Jour. Laryngol., 37, pp. 281-284, 1922.
Key-Aberg: Thrombosis of the Cavernous Sinus. Acto. Oto. Laryngol., Stockholm, 111, pp. 36-47. 1921-23.
Maybaum, J. L.: Cavernous Sinus Thrombosis of Otitic Origin. Am. Otol. Rhinol. and Laryngol., 30, pp. 1061-64, 1921.
Reese, W. S.: Cavernous Sinus Thrombosis. Atlantic Med. Jour., 37, pp. 19-21.

Discussion follows paper of Dr. Hasty, page 574.

SEPTICEMIA OF OTITIC ORIGIN*

By FREDERICK E. HASTY, M.D.,
Nashville, Tenn.

Diagnosis.—The temperature chart is usually the first source of information which arouses one's suspicion that there is an active infection in the blood stream. Each marked rise in temperature represents a bacterial shower, although after the lateral sinus becomes thrombosed there may be little variation in the temperature.

Positive Findings.—The blood culture is one of the most valuable means of arriving at a definite diagnosis. The degree of success in this procedure depends upon the laboratory technique and upon one's being fortunate enough to collect the blood at a time when the organisms are flowing in the blood stream. I feel that all cultures should be made at a selected time. In adults a specimen should be collected when the temperature approaches 103°, and another specimen if it goes as much as two degrees higher. In children the first culture should be made when the temperature approaches 104°. Atkins, reporting on forty cases of lateral sinus thrombosis, states that a positive culture was found in 52.5 per cent of the cases. It seems, in the experience of most surgeons, that the percentage of positive cultures ranges from 40 to 60.

Physical Examination.—In the majority of cases there is but little to be obtained by palpating the neck and mastoid region. I am aware of the classical description of the cord-like feeling of the thrombosed jugular vein. I have found this condition in only one case. Tenderness over the emissary vein is not infrequently found in a well developed mastoiditis in which the cells extend for a considerable distance behind the lateral sinus, and it is frequently found in perisinus abscess. After the lateral sinus is extensively thrombosed and after the inflammatory process has extended out over the dura, there may be some evidence of intra-cranial pressure due to the thrombotic clot and to the obstruction to the venous flow of the blood in the head. Tobey and Ayer have devised a manometer which seems to offer considerable possibilities in the way of diagnosis. Pressure upon the spinal accessory, the glossopharyngeal and pneumogastric nerves may be the result of a thrombosis in the upper part of the jugular vein and is likely to cause hoarseness, aphonia, dyspnea and sometimes dysphagia. Various writers have discussed the changes observed in the optic nerve. In the recent cases of thrombosis I have never been able to find any fundus changes of definite value. I have, on some occasions, found that there seemed to be some disturbance in the intraocular circulation and perhaps in the nerve head.

If a thrombosis is of long duration there are usually definite changes. The Crowe-Beck tests may be of value in some cases. If one occludes the normal jugular vein by pressure and observes congestion in the veins of the fundi and of the superficial veins of the face, the jugular vein of the opposite side is occluded.

General Signs and Symptoms.—The euphoria, or the mental attitude of well-being, is very characteristic, and this at times becomes a valuable point in differential diagnosis. Of course, later in the disease, the patient may become exhausted, depressed and considerably beclouded

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Nineteenth Annual Meeting, Dallas, Tex., Nov. 9-12, 1925

mentally. I saw one such case after she had been delirious some three weeks.

DIFFERENTIAL DIAGNOSIS

As has been said, a marked rise in the temperature is the first evidence of acute blood stream infection, though of course innumerable other conditions may be responsible. Pneumonia demands consideration in the majority of cases. If the internist should suggest such a possibility, it is well to make an x-ray plate of the chest with the bed-side unit and to repeat this in from 12 to 24 hours if positive information is not sooner obtained. This method will be found of particular value in children. All the urine should be saved. An analysis should be made twice daily until a diagnosis is established; and in this connection it should be remembered that septicemia itself is likely to set up considerable kidney disturbance rather promptly. Meningeal symptoms in children may be due to a marked toxemia from any cause. In children, as well as adults, there may be gastro-intestinal disturbances either as a result of the increased temperature, or as a factor causing the temperature. Spinal puncture is usually disappointing where an active meningitis has not developed. Pneumonia or any other marked systemic toxemia is likely to cause some changes in the spinal fluid. While it is very comforting to have a positive diagnosis before surgery, this cannot be justly awaited in all cases. It is perhaps impossible to have a positive diagnosis in more than 50 to 75 per cent of cases before the time when surgery should be done. To have a diagnosis early and to deal with the case promptly increases to a very marked degree the patient's chance of recovery. This is especially true in children. My experience coincides with that of others in that a child under 12 years of age shows a recovery about equal to 50 per cent of the expectancy in adults. It is more or less atypical to see a child put up a good fight for a period of time and then to fail and die very rapidly. I feel that an early diagnosis is of paramount importance, and except in cases of pneumonia and possibly certain cases of nephritis, the patient can be explored under gas anesthesia, if it is done rapidly, with little if any bad effect upon the co-existing conditions. Day has formulated a proposition that our successful results will be inversely proportionate to the delay in making the diagnosis and instituting the surgical remedy.

PATHOLOGY OF THE LATERAL SINUS

In exposing a lateral sinus, it is absolutely essential that the operative field be kept clear of blood; otherwise valuable evidence of local pathological condition may be destroyed. Atkins states that in his series of cases 62.5 per cent showed changes in the outer wall of the lateral sinus as evidenced by one or more of the following signs: loss of normal luster, discoloration, glazed appearance, atrophy, granulations and necrosis. I recall two cases in which I think there was simply a peri-phlebitis, and that this was evidenced by an exudate between the sinus wall and the bony covering. The appearance of the sinus wall cannot, I think, in all cases be taken as a definite indication of the amount of pathology within the sinus. Pulsations of the sinus with respiration is a sign that I never have been able to use to advantage. Sir William Milligan states that pulsation whether present or absent is of little value as a diagnostic sign. I rather agree with Day, who states that the use of the needle and punctures to explore the lateral sinus are unreliable and, moreover, that they will not show a mural clot. I have seen one accident in which the needle was passed on through the opposite wall into the brain.

SURGERY

The more quickly surgery can be done, the better chance the patient will stand for recovery. This is especially true in children. If a definite diagnosis has been established, the jugular vein is to be dealt with first. A long skin incision should be made and each succeeding incision should be a little shorter. I prefer to split the sternocleido-mastoid muscle. Every effort should be made to avoid traumatism to the tissues, special care being observed not to leave pockets in the lower end of the wound. Every jugular should be ligated above the facial vein. *Case 1*, that I briefly report, substantiates this point. If the vein seems to be normal, the simple ligation without resection is sufficient. If the vein is diseased and if the thrombosis has already extended into the neck, a resection of the jugular vein from above the facial vein to an inch below the point of disease should be made. The wound in every case should be left open. Placing sutures consumes time and favors the development of deep abscess formation.

Surgery of the Lateral Sinus.—The first exposure of the lateral sinus can, in the majority of cases, be most easily made in the region of the knee. The sinus should be exposed in the direction of the jugular bulb as far as possible. The

importance of this point cannot be over stressed, as it is not at all unusual to find a sinus wall that looks comparatively healthy in the region of the knee, and shows little or no evidence of pathology until the bulbar region is exposed. Friesner has suggested a technic for exposing the jugular bulb that I think might be followed in general, adapting it to the individual case. He says:

"Remove the tip, thoroughly expose the digastric muscle, separate it with periosteum from the skull, follow the sinus through the digastric groove underneath the floor of the skull, slit open the sinus as a guide and follow it to the bulb. This will lead you internally to the facial nerve and leave it safely."

While it may not be necessary to expose the bulb completely in every case, yet to go beyond the first turn of the sinus does facilitate drainage. In many cases I am convinced that a greater part of the pathology is in the bulbar region and that our complications frequently have their origin here. In removing the pus and necrotic material from the bulb, no cutting instrument should ever be allowed to face the dura. The necrotic material should be removed, with the hope of preventing pressure and extension of the disease up the inferior petrosal sinus. It is well to leave a soft, loose-fitting rubber tube in this part of the wound. The sinus should be exposed in the direction of the torcular for about one-half an inch beyond the thrombosis. This can be done very rapidly with a strong rongeur. After free bleeding is established, the sinus should be compressed with a plug of gauze engaged under the bone. The wound should not be sutured unless the operation has been very extensive.

POST-OPERATIVE TREATMENT

Rest and nourishment are the two essential features in post-operative care. Only a limited number of selected visitors should be allowed. The attitude and behavior of the physicians and nurses should be such as to stimulate hope and contentment. The diet should be carefully adapted to the individual. Rather nourishing foods should be served as long as the temperature remains roughly between 100 and 103°. If the temperature has remained at or below 100 for 24 hours, a still more substantial diet should be allowed. It has been my observation that if the food is well selected for the individual and is properly prepared, a much more nourishing diet can be allowed for these patients than is customary for most conditions running the same amount of temperature. Dressing should be done when indicated. If there is drainage from the bulbar end of the lateral sinus, this part of the wound should be dressed daily. Irrigating solutions of any and all kinds should be left off; likewise should antiseptics, with the possible exception of a little alcohol on the scalp adjacent to the wound. An involvement of the lungs in this condition is not infrequent, therefore a daily observation gives a good background for the consideration of possible complications. Medication should be prescribed as indicated.

INTRAVENOUS THERAPY

A discussion of this subject at the present time would not be complete without some reference to mercurochrome, and in this connection the reports that are now being published in the different parts of the country stand as a warning. Piper has recently stated:

"As far as the use of mercurochrome intravenously in blood stream infections is concerned, I would say that my increased clinical experience makes it impossible for me to subscribe to the last part of the original conclusion, namely, that a solution of mercurochrome has no deleterious effects. We cannot too strongly impress upon the profession that in spite of reports of brilliant recoveries, this is undoubtedly a dangerous procedure and is only warranted by the severity of the condition with which we are confronted. Its promiscuous use is to be discouraged, as this will unquestionably bring whatever merit this treatment may possess into definite disrepute."

The *Journal of the American Medical Association* will soon publish a paper written by St. George presenting five post-mortems of cases in which mercurochrome had been administered intravenously and all of which showed in a rather marked degree the changes usually associated with mercuric chlorid poisoning, namely, intense hemorrhagic and ulcerative colitis and acute parenchymatous nephritis, with fatty and calcium degeneration.

In a personal communication Douglas Symmers states:

"In the course of the past year twelve subjects have come to autopsy in the Pathological Laboratories of Bellevue Hospital, under the auspices of the Chief Medical Examiner of the City of New York. The clinical history in each case was to the effect that the patient had been treated by ordinary therapeutic doses of mercurochrome administered intravenously. At autopsy they presented the characteristic anatomical changes of poisoning by mercury, and mercury was obtained from the tissues chemically in noticeable large amounts. As a result of our experience in New York and because of reports of other deaths from the intravenous use of mercurochrome in various parts of the country, I have my doubts concerning its innocuousness."

I have used mercurochrome with apparently satisfactory results, yet I am inclined to feel that repeated blood transfusion, properly done, is the safer procedure.

CASE REPORTS

I wish briefly to report a few cases which serve to illustrate some of the points that I have attempted to make in this paper:

Case 1.—Jack O., aged 7, was admitted to the hospital with a history of chronic mastoiditis, high temperature for several days, and two chills. A simple mastoidectomy was done. The lateral sinus was found to be thrombosed. The sinus was obliterated and the jugular vein was ligated below the facial vein, but not incised.

Problems.—Septicemia of several days duration in a child. A mastoidectomy, a lateral sinus and a jugular operation were to be done at one time.

Mistakes.—I ligated the jugular vein below the facial vein and closed the neck wound.

Complications.—The vein ulcerated through, with deep abscess formation in the neck, facial vein thrombosis and necrosis. One abscess ruptured externally just below the eye and another into the mouth. The cellulitis of the neck and face was frightful and very nearly cost the patient his life.

Case 2.—Willie M. G., age 10, was admitted to the hospital with a history of chronic mastoiditis. A simple mastoidectomy was done, but the septic temperature and the chills continued. I saw the patient about a week later, obliterated the lateral sinus and ligated and incised the jugular vein above the facial vein and closed the neck wound.

Problems.—A 10-year-old child had a sepsis of a week's duration, and chronic mastoiditis, with a very thick layer of eburnated bone over the lateral sinus except for a very small area. The glands in the neck were matted over the vein and a dissection was difficult.

Complications.—The vein ulcerated through. A large abscess formed in the neck with extensive cellulitis over the face and neck, and at the time of death I think cavernous sinus thrombosis was developing.

Mistakes.—The neck wound should not have been closed.

Case 3.—Mary A., age 33, was admitted to the hospital with a history of chronic mastoiditis, one chill and temperature of 105°. A simple mastoidectomy was done. The sinus in the region of the knee seemed to be normal. Blood culture made at the time of the operation was positive. The patient was doing so well following the mastoidectomy that further surgery was postponed until the temperature again went to 104°, when I exposed the sinus in about the usual way and ligated the jugular vein.

Problems.—The patient had septicemia of several days duration, and ulceration of the sinus wall.

Complications.—She had erysipelas and later a cavernous sinus thrombosis. Death occurred ten weeks after the original operation.

Mistakes.—We should not have waited after blood cultures showed very definite positive growth of Streptococcus hemolyticus. The bulbar region surely should have been more thoroughly exposed.

Case 4.—Mrs. M. B., age 39, was admitted to the hospital with a history of mastoiditis of some four or five weeks, high temperature, frequent chills and delirium for three weeks. Her white blood count was 4,600, polymorphonuclears 74 per cent, and blood culture was positive. The right shoulder was considerably swollen. X-ray of the mastoid suggested early infection, but the findings were not sufficient to make a diagnosis of mastoiditis. I saw the patient three days later. Another surgeon did a simple mastoidectomy. I exposed the sinus to the region of the torcular and to the bulb. The sinus wall was necrotic from the knee to the bulb. The jugular vein was ligated and incised.

Problems.—The x-ray and blood count were of little value. She had septicemia of several weeks' duration. A mastoidectomy, lateral sinus and jugular operation were to be done on a patient who seemed to be in a hopeless condition. The sinus wall was necrotic to the jugular bulb.

Complications.—There was metastasis to the shoulder, finger and coxygeal joints.

Results.—The patient now has good function of the shoulder. The finger is still contracted. She was discharged five weeks after the operation.

Case 5.—Sarah C., age 10, was admitted to the hospital with a history of acute mastoiditis, high temperature and several chills during the week. A simple mastoidectomy was done. I saw the patient 24 hours later. Blood culture made at the peak of her temperature was reported the next day positive. I exposed the sinus, which was fairly healthy in the region of the knee, but badly diseased toward the bulb. The jugular vein was ligated and incised above the facial vein. Five days later mercurochrome was given, and her temperature dropped from 105 to 99°.

Complications.—The jugular evidently ulcerated through, as there was considerable drainage of pus from the upper end of the wound, beginning some three or four days after the operation and continuing several days.

Case 6.—Mrs. W. T., age 48, was admitted to the hospital with a history of mastoiditis for several days. She had high temperature, at times with considerable meningeal symptoms. A simple mastoidectomy was done. I saw the patient four days later. Blood culture was made while her temperature was 105, and reported positive 18 hours later. I exposed the sinus almost to the torcular well down to the bulb. The sinus wall was necrotic, and the jugular vein was ligated and incised above the facial vein.

Problems.—There was a sepsis of undetermined duration in a patient with history of heart and kidney disease. The sinus wall was necrotic in the region of the bulb. Meningitis developed, and the patient died four days later.

Case 7.—Francis D., age 10, was admitted to the hospital with a history of acute mastoiditis with high temperature and chills for several days. I saw him two days later. Repeated blood cultures were negative, but forty-eight hours after the mastoidectomy I did a jugular and sinus operation. The jugular vein was ligated above the facial vein and incised.

Complications.—He had a lung abscess and metastasis to the elbow joint. The rib was resected, and pus drained profusely, but the child died one month after the original operation.

The majority of the above cases have been selected to illustrate mistakes, and this group

of cases cannot be taken as an index of my results in caring for septicemia of otitic origin.

CONCLUSIONS

(1) The temperature chart is the most valuable source of information.

(2) Blood cultures should be made when the temperature approaches its highest point.

(3) A diagnosis is arrived at by (a) temperature chart, (b) blood culture, and (c) a satisfactory process of elimination.

(4) An early diagnosis is of paramount importance.

(5) The time consumed in doing the surgery is an important factor in the prognosis.

(6) The jugular bulb should be thoroughly explored.

(7) (a) The jugular vein should be ligated above the facial vein, and (b) the neck wound should not be closed.

(8) Post-operative treatment consists of (a) rest, (b) nourishment, and (c) blood transfusion, early and frequently repeated.

(9) Finally septicemia of otitic origin offers a fair prognosis if diagnosed early and properly managed.

BIBLIOGRAPHY

Atkins, R. T.: Lateral Sinus Thrombosis, N. Y. State Jour., April 23, 1924.
Milligan, Sir Wm.: Jour. Laryngol. and Otol., Jan., 1923.
Piper, E. B.: Amer. Jour. Obst. and Gyn., p. 17, Jan., 1925.
Smith, S. M.: Etiology and Diagnosis of Lateral Sinus Thrombosis, Atlanta Med. Jour., June, 1924.
Tobey, G. L., and Ayer, J. B.: Dynamic Studies on the Cerebrospinal Fluid in the Differential Diagnosis of Lateral Sinus Thrombosis, Arch. Otol., July, 1925.
Symmers, D.: Personal communication.
St. George: Personal communication.

422 Lambuth Bldg.

DISCUSSIONS (Abstract)

Papers of Dr. Montgomery and Dr. Hasty

Dr. John N. Foster, Houston, Tex.—Dr. Hasty stresses the need of early diagnosis and operation in order to increase the chances of a favorable outcome. This is, of course, true to a considerable extent, and yet this condition is not so rapidly fatal as to preclude taking sufficient time to make a careful diagnosis. When I first began this work I had the impression that if, after a mastoid operation, a patient had a chill, fever and sweat, it was essential to open the sinus at once, or the patient would probably die. Now we know that this is not the case. One can have blood cultures made, wait for a repetition of the chill, watch the lungs, etc. Of course, I do not mean to excuse unnecessary delay. Many cases come to us that have been allowed to go to a desperate condition where the diagnosis is plainly written on the chart.

Given a mastoiditis with repeated rigors and sweats we may safely assume that the patient has an involvement of the venous channels, for these symptoms do not come with simple mastoiditis, however extensive. In such a case the sinus should be explored at the primary operation, and if more than a phlebitis, with a peripheral thrombus exists, the jugular should be ligated. If the diagnosis is not clear, the sinus should be widely uncovered in order that it may be opened later easily if necessary.

On one point in dealing with the jugular I have not been able to bring myself into accord with many of my confreres, and that is the belief that simple ligation of the vein is as safe a procedure as excision. Dr. Hasty stresses the fact that the vein should be ligated above the facial. I agree with him, but believe that the vein should be freely exposed, ligated well down below possible involvement, dissect up and, if filled, ligated well above the facial as high as practicable and the intervening part removed. This is not a tedious or prolonged operation; in fact, it takes only a few minutes after the vein is exposed. Furthermore, it obviates the necessity of leaving the entire neck wound open. A good drain at the upper and lower ends is all that is necessary and the cosmetic result is much better.

I cannot close without referring to several cases in very young children that have come under my observation, where with double suppurative otitis media there have been distinct septic rigors and sweats without clinical evidence of mastoiditis on examination or the x-ray plates, and with no signs to localize the focus of absorption on either side. In such cases my interpretation of the pathology has been a phlebitis of the jugular bulb directly from the middle ear. If it had been confined to one side, I should have felt that I should operate, but under the circumstances all one could do was wait, and I am happy to say that none of the cases was fatal. They all gradually cleared up.

Dr. Clifton M. Miller, Richmond, Va.—Cavernous sinus thrombosis is so inaccessible for operative procedure that it is well-nigh impossible to feel that it can be attacked surgically with any degree of probable relief. The intimate connection between the cavernous sinuses of the two sides by large venous channels make the two sinuses practically one, and, in my opinion, one sinus alone would never be affected by thrombosis, the second one being always involved, and from this the other sinuses at the base of the skull, all of which have a most intimate connection with the cavernous sinus. It would seem to me that we might safely say that when diagnosis of cavernous sinus thrombosis is made and the patient recovers we have been mistaken in our diagnosis.

Dr. Homer Dupuy, New Orleans, La.—This affection is apparently so hopeless, so unamenable to our present-day surgery, that we must admire and approve any attempt, no matter how bold, to effect a cure. We are looking for early signs of this condition. Exophthalmos is already a late signal. We must look for, and try to find, intra-ocular evidence. Ligation of the carotid may offer us some hope. I believe that, with early, repeated and ultra-refinements in our ophthalmic examinations, we may secure the necessary data to justify the most radical kind of surgery. In this lies our only chance of success. In my four personal experiences all patients died. They were all late diagnoses, and no surgery was attempted. In two cases there was

an involvement of both sinuses. I have promised myself to be bolder in the presence of such a condition.

Dr. William D. Gill, Fort Sam Houston, Tex.—Where facilities permit, a culture should be made from the middle ear at the time the drum membrane is incised in every case of acute suppurative otitis media. A straight platinum wire is quite satisfactory for the purpose. We believe it should be passed through the incision in the drum into the middle ear, as in this manner we are more certain of avoiding contamination with organisms from the wall of the external auditory canal. Ordinary nutrient broth may be used as a culture medium, but it is far better if we add to the nutrient broth a small quantity of hemolysed blood. Still better, we may streak the suspected material upon the surface of a blood agar plate, for on this medium we may readily recognize the presence of hemolytic organisms. Taking a culture from the middle ear is a simple procedure, but nevertheless it is very frequently neglected. We know that the pneumococcus causes a type of mastoiditis that is relatively non-painful, and it necessarily follows that if the pneumococcus is isolated from the middle ear we should base our operative interference in mastoiditis on subjective symptoms of lesser severity than we should in mastoiditis caused by other pyogens. Formerly we considered the Streptococcus mucosus, also referred to as the Streptococcus capsulatus, capable of producing a relatively painless mastoiditis. This confusion was due to the fact that the so-called Streptococcus mucosus or capsulatus was in reality a pneumococcus. It had been separated from the Streptococci because of its bile solubility, and is now classified as Pneumococcus Type III. Blood cultures should be taken routinely on all cases of mastoiditis, and in cases where lateral sinus involvement is suspected we should not be content with a single culture, as our first culture may be sterile. This may be due to several causes. We may have taken our culture before a bacteremia has been established, or the bacteria may be in the blood in such small numbers that they are not found in the amount of blood taken for the culture. It may also happen that below the infected thrombosis there may be another obturating uninfected thrombosis which prevents the bacteria from entering the circulation, or there may be an infected thrombus completely closing the lumen of the vessel and not undergoing fragmentation in its lower extremity. The fact that the blood culture is negative at one time and positive at another may perhaps also be explained by the fact that the bacteria are disseminated into the blood stream at certain periods, and in particular during the height of the fever. If we are content with a single culture, we may miss a shower of bacteria thrown into the blood stream from the infected focus, and thus be led to believe that there is no blood stream infection. The Streptococcus causes a diffuse type of inflammation of the mastoid that may be likened to an acute osteomyelitis rather than an empyema, and a type that is especially prone to extend into the lateral sinus. We believe that needle puncture of the lateral sinus to diagnose thrombosis is inadvisable because of the danger of introducing infection into a sinus that is not already involved. We should be able to make our diagnosis on gross external appearance of the sinus, coupled with the clinical and laboratory findings. Sinus periphlebitis is usually very easily recognized by gross external appearance, and is strong presumptive evidence that the interior of the sinus is involved. X-ray examination should always be a preliminary to mastoid operations, as it is a valuable guide to the mastoid, giving information as to the degree of involvement present, and the type of mastoid we are dealing with. It may also prevent our overlooking zygomatic extensions, which are so troublesome and easily missed.

Southern Medical Journal

JOURNAL OF THE
SOUTHERN MEDICAL ASSOCIATION

Published monthly by the Southern Medical Association, Empire Building, Birmingham, Ala. Annual subscription $4.00. Single copies 35c each.

Entered as second-class matter at the Post Office at Birmingham, Ala., under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1106, Act of October 3, 1917, authorized December 20, 1921.

DR. M. Y. DABNEY, Editor
C. P. LORANZ, Secretary-Manager

Vol. XIX JULY 1926 No. 7

EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Twentieth Annual Meeting
Atlanta, Georgia, November 15-18, 1926

EFFECT OF THYROID EXTRACT UPON FORMATION OF BILE

The best known physiological effect of the administration of thyroid extract is the general increase of metabolic rate, or increase of the rate of oxidation in the body. To consider the results more in detail, in young white rats after feeding thyroid, a decrease in the rate of growth is noted, with hypertrophy of the heart, liver, kidneys and adrenals and disappearance of fat. Disappearance of the store of liver glycogen has also been observed, and the increased catabolism of proteins and fats is secondary to this.[1] [2]

Working with tadpoles to whom he fed thyroid, Speidel[3] noted regularly occurring changes in the rate of bile pigment production, which he regards as an indication of erythrocyte destruction. The normal gall bladder in tadpoles which he studied is a very pale, watery, green color, which gradually darkens after thyroid feeding, the bile pigment (biliverdin) apparently becoming more concentrated in the gall bladder. The animal meantime undergoes the typical metamorphosis. In all species it was possible to arrange a series of colors varying in degree with the length of thyroid treatment. All thyroid-treated animals without exception, after a latent period of about two days, showed darker bile with increased pigment concentration. There was some evidence of increase in erythrocyte degeneration in the liver, and in the gut macrophages containing erythrocyte debris could be seen passing through the lining to the lumen.

Since water is extruded from the body of a tadpole during thyroid accelerated metamorphosis, and there is some dehydration of the tissues, this might to a limited extent account for the deeper bile color. In untreated tadpoles undergoing normal metamorphosis there is some deepening of the bile color, but it is less pronounced than in those who have received thyroid. Speidel believes that the major factor contributing to pigment concentration in the gall bladder is the increased rate of destruction of erythrocytes and of elaboration of the pigments, which are believed to be derived from hemoglobin, which must come from worn out erythrocytes. In the tadpoles the increased heart beat, circulatory rate and muscular activity subject the erythrocytes, he says, to "rough treatment," and increased destruction results.

There is a possibility of increased erythrocyte destruction in human beings who receive thyroid extract. These results of animal experiment should be taken into account whenever thyroid medication is contemplated, either for the purpose of reducing obesity or for more recognizable thyroid deficiency.

1. Brubaker, A. P.: Textbook of Human Physiology, Philadelphia: P. Blakiston's Son & Co., 1925.
2. Vincent, S.: Internal Secretions and the Ductless Glands. New York: Physicians and Surgeons Book Co., 1925.
3. Speidel, C. C.: Studies of Hyperthyroidism. Jour. Exper. Med., 43, p. 703, May 1, 1926.

WHITE AND NEGRO SWEAT GLANDS

The negro seems to be subject, in different degrees, to all the diseases to which the white man is heir. He is more subject to respiratory infections such as pneumonia and tuberculosis than the Caucasian and less susceptible to heart and kidney diseases. He stands heat better than the white man; cold, worse. In general he has less resistance to bacterial invasions than has the white. He is subject to one form of

anemia, sickle cell anemia, which the white man never has, and since negro children nowadays are notably subject to rickets and developmental abnormalities, the negro of another generation may show an entirely different set of diatheses.

Certain quantitative differences between white and negro sweat glands have recently been observed, which may to some extent explain the differences in susceptibility to heat and cold, and which perhaps occurred originally in the negro as an adaptation to a warm climate.

It was long thought that, though some of the sweat glands distributed over the body were much larger than others, all were histologically the same. However, it has been shown that certain large glands to be found in different parts of the body, notably in the axilla, have a different embryonic development and different structure from that of the small common glands. The large glands have been called apocrin, and the smaller exocrin. The small exocrin glands produce a fluid which forms in droplets in the cell cytoplasm and is pushed out. In the case of the apocrin glands a part of the cell is lost during secretion. The exocrin glands originate from the free surface of the skin, while the apocrin originate in a hair follicle, and can occur only where hair is found at some time in life. It has also been observed that the apocrin glands usually contain iron, while the small endocrin glands do not.[1]

Schiefferdecker[2] showed that the apocrin glands are very numerous in mammalian animals. They are fewer in apes than in other animals and are fewest in man. He believed that even the various human races may differ from one another in the abundance of their apocrin sweat glands.

Homma has recently made a study of the quantitative differences between the glands in the pure-bred negro type and in the white. At autopsy, in about two hundred and fifty cases, he took pieces of skin from the middle of the breast, from half way between the umbilicus and symphysis, from the mons veneris, and from the region around the anus, because the large glands occur in these regions but are sparse. In these regions, confirming Schiefferdecker's findings he noted that the apocrin glands were three times more frequent in negroes than in whites. They were twice as frequent in women as in men, and particularly the apocrin glands of the axilla were better developed in women than in men. The glands probably are not reduced in old age, he thought, and they do not occur until puberty.

It is possible that histology here has found an explanation of the observed difference between the odor of the average white man and the average negro. The large number of apocrin cells, the cells which exude some of their protoplasm when secreting, may furnish the characteristic scent of the perspiring negro.

1. Homma, Hans: On Apocrin Sweat Glands in White and Negro Men and Women. Bull. Johns Hop. Hosp., 38, p. 365, May, 1926.
2. Schiefferdecker: Zoologica, 27, Nr. 72, quoted by Homma.

BLOOD CHANGES AFTER SEVERE SUPERFICIAL BURNS

The cause of death after superficial burns is generally thought to be absorption of toxic products (proteoses) from the burned surface. On that basis good results have been reported in the treatment of children by exsanguination-transfusion; and debridement and other measures to reduce absorption of the toxic proteoses have also been reported to be beneficial. In the JOURNAL in April, a description of treatment by injection of hypertonic sodium chlorid was described,[1] and two cases were reported which had high hemoglobin and low chlorids in the blood.

Blood changes after burns have been reported by a number of writers, notably Underhill,[2] who found an increased concentration of the blood, with increased hemoglobin and decreased chlorids after severe burns. Greenwald and Eliasberg,[3]

1. Bigger, I. A.: Hypertonic Sodium Chlorid Solution Intravenously in the Treatment of Extensive Superficial Burns. S. M. J., 19, p. 302, 1926.
2. Underhill and Others: Blood Concentration Changes in Extensive Superficial Burns. Arch. Int. Med., 32, p. 31, 1923. Quoted by Greenwald, H. M.; and Eliasberg, H.: The Pathogenesis of Death from Burns. Amer. Jour. Med. Sc., 171, p. 682, 1926.
3. Greenwald and Eliasberg (q. v. s.).

who examined the blood of rabbits after burns, observed an immediate sharp rise in the circulating sugar. Upon autopsy of the rabbits, changes in the suprarenal glands were found which apparently indicated hyperactivity of these glands. Important changes in the suprarenals after burns have elsewhere been noted. Greenwald and Eliasberg also report two human cases in which, though glucose and adrenalin were given intravenously before death, blood withdrawn immediately post-mortem showed little or no sugar. They conclude that after burns there is an initial stage due to shock in which there is hyperactivity of the suprarenals with resulting high blood pressure. Then there is a secondary stage due to degenerative changes, particularly in the suprarenals, probably accompanied by lower blood sugar. They deduce from this that administration of adrenalin is to be restricted to only the secondary stage of suprarenal exhaustion, and that it is contraindicated in the primary stage. This conclusion may be correct but is not justified by the evidence at hand.

Adrenalin is a hormone secreted by the suprarenals which acts as a messenger to the liver, among other functions. Upon release of adrenalin into the circulation, the liver is stimulated to release its stored glycogen, which becomes blood sugar, and the blood sugar level is thus raised.[4] It is possible that the condition of shock following a severe burn, or perhaps the absorption of toxins and effort to repair tissue, require an extra supply of sugar and of adrenalin to release it. Perhaps injection of adrenalin from outside would lighten the task of the suprarenal bodies in supplying it. Perhaps adrenalin, perhaps glucose, perhaps chlorids, may be indicated in the primary stage of treatment of burns. The most that can be said at present is that here seems to be a very fruitful field for the application of extensive blood chemistry studies in a larger series of cases.

4. Cushny, Arthur R.: Pharmacology and Therapeutics or the Action of Drugs. Sixth Ed., Philadelphia and New York: Lea and Febiger, 1924.

Atlanta—Where We Meet

BEGIN THINKING OF ATLANTA

By FRED HOUSER,
Secretary, Atlanta Convention and Tourist Bureau,
Atlanta, Ga.

Put a little memorandum on your calendar pad: "Atlanta, November 15-18." Tell your wife and daughter to begin to plan a trip to Georgia for that week.

We want every one of you, and we promise you'll enjoy every minute of your visit. There'll be lots of business, of course, but lots of fun, too.

Somehow, nearly everyone who comes to Atlanta on a convention visit seems to have a good time, or else they're terrible prevaricators or exceptionally polite, for that's what they tell us when we run across them years afterward.

Ask some of your friends who attended the convention of Rotary, of Kiwanis, or the Elks in Atlanta, or even the Shrine, which held its great imperial council meeting here back in 1914. They're all boosters for Atlanta as a convention city.

Perhaps one reason is that Atlanta is a specialist on entertaining convention throngs, whether they number a hundred or many thousands. She begins to plan months ahead, with a determination to see that nobody has a dull hour on hand.

We've all been to conventions where visitors were registered, welcomed in an official address, and left to their own devices for the rest of their stay. With the men in a business session, their wives sat in their hotel rooms. If anybody wanted to go anywhere, they had to ask the hotel clerk and then hunt a taxicab.

We'd be ashamed to have that happen in Atlanta. We have plenty of automobiles, and we drive them ourselves or let our wives do it, and there's always a flock of them close by the hotel waiting to take you to Stone Mountain, or wherever you like, with someone to point out the sights of interest.

The committees haven't framed up all the program for the convention, but some of the high lights are settled upon. They guarantee that you'll see Atlanta's wonderful homes, street after street of them, and that those who want to see our South's memorial at Stone Mountain shall be driven out there over a wonderful road that goes through Druid Hills, famous the country over for its beauty of residences and trees. You'll hear later of the detailed program of entertainment, and can rest assured that every minute will make you love Atlanta a little more.

"What kind of a room will I get?" is always a big question when planning a convention trip. You'll get a good one in Atlanta, whether you stop at the official headquarters or not. There are numerous hotels, all modern, well conducted, comfortable, ten of which are of the first-class type with more than 200 rooms each—and the rates don't go up when a convention is booked.

Do you like golf? Then bring your clubs along, and we'll make up as many foursomes as you like, with a home-town man along to point out the flag just over the hill and you can play the famous East Lake course, where Bobby Jones and Watts Gunn and Alexa Stirling learned to swat the ball in the eye, or at Druid

Crippled Children's Hospital

Hills or Brookhaven, or any one of our nine fine courses.

Weather? Well, we can't guarantee that it will be perfect, but we'll bet you 10 to 1 on it. There is usually sunshine, with just a bit of briskness which makes you full of pep. Your wives will revel in the long drives over the Georgia hills, with all the trees decked in their fall apparel, looking for all the world like a kaleidoscope.

Interested in historic things? We will show you an old-fashioned iron lamp post at one of the busiest corners of the city with a hole through its base—a hole made by one of Sherman's cannon balls just before he paid us an official visit and became so "careless with fire" that all Atlanta burned to the ground. We'll show you the battleground of Peachtree Creek and Fort Walker, and the spots where noted generals fell. We'll take you out to Grant Park and show you the Cyclorama, a painting of the Battle of Atlanta, which is 50 feet high and 400 feet in circumference, and you'll think you are standing in the middle of the conflict. We'll take you to the old home where Joel Chandler Harris wrote his inimitable stories of "Uncle Remus."

And the hospitals, of course, number 12 of the first-class variety in Atlanta, several of which are new and equipped in the most modern ways known to science. Wesley Memorial, a 300-bed institution, located on the Emory University campus, cost approximately $1,750,000. In connection with this hospital is a Class A training school for nurses.

Georgia Baptist Hospital is another new one, and the plant operated at this time is to be used ultimately as a home for nurses. The first unit of the main hospital building is to be erected soon at the cost of $800,000.

Grady Hospital is owned and operated by the City of Atlanta for the benefit of the citizens who need medical attention and are unable to pay for it. There are accommodations for both white and colored patients, and recently, through the benefaction of the late Mr. Albert Steiner, a new building has been erected and devoted exclusively to the treatment of cancer.

But a story within itself is the Scottish Rite Hospital. It is the inspiration and pattern for the chain of hospitals for crippled children being erected by the Shrine throughout the country. There are only three requirements for admission to this institution: normal mentality, possibility of relief and inability to pay. The hospital is supported by the Scottish Rite Masons of Atlanta and is doing wonderful work with the crippled child.

We want just as many visitors at the Southern Medical Association meeting as there are members, and we want them to bring their wives. We want to show them our city, for we're very proud of it; and we know that we'll enjoy meeting medical men from all over the South. So come to Atlanta in November, and we promise that you'll be just as glad you came as we shall be to have you as our guests.

Correspondence

IS CATARACT HEREDITARY?

Editor, SOUTHERN MEDICAL JOURNAL:

In 1903 I operated upon one eye for cataract on James A. Porter, age 66, of Greenville, Madison County, Florida. In 1904 I operated upon the other eye.

In 1914 I operated upon one eye of James B. Porter, age 44, for cataract. In 1915 I operated upon the other eye.

In 1920 I operated upon one eye of Wm. H. Porter, aged 51, for cataract. In 1921 I operated upon the other eye.

In 1923 I operated upon one eye of Mrs. Lilla Porter Warren, age 54, for cataract. In 1925 I operated upon the other eye.

In 1925 I operated upon one eye of Lee J. Porter, age 58, for cataract. Cataract in the other eye is not yet mature.

John T. Porter, age 66, has failing vision from incipient cataract in both eyes.

All these are children of James A. Porter, and all are residents of Greenville, Madison County, Florida.

To date I have operated nine times upon the father and four children of the Porter family for cataract. A fifth child is now the subject of incipient cataract.

In 1878 I operated upon both eyes by needle (discission) for soft cataract on Ringgold Godwin, age 15, of Cairo, Ga. In 1884 I operated for senile, or hard cataract, upon John B. Godwin, age 58, Cairo, Ga., the father of Ringgold.

In 1880 I operated for cataract upon Rev. E. K. Booth, age 60, at that time stationed in Concord, Fla. In 1924 I operated upon one eye of John L. Booth, age 62, Thomasville, Ga., a son of the Reverend E. K. Booth

In the Porter family, a father and four children were operated upon for cataract, and a fifth child is the subject of incipient cataract. In the Booth family, a father and one son had cataract. In the Godwin family, a father and one son had cataract.

None of these parents is now living. All of the children are living, and at the named post offices.

I submit these facts to those who do not think that cancer and pulmonary tuberculosis are hereditary, and ask: "Is cataract hereditary?"

T. M. McINTOSH, M.D.

Thomasville, Ga., May 20, 1926.

Book Reviews

Abdominal and Pelvic Surgery for Practitioners. By Rutherford Morrison, Hon. M.A., and D.C.L., Hon. LL.D., M.B., F.R.C.S., (Ed. and Eng.) Consulting Surgeon, Royal Victoria Infirmary and Dental Hospital, Newcastle-on-Tyne; Consulting Surgeon War Pensions Hospital; Emeritus Professor of Surgery, Durham University. 212 pages. New York and London: Humphrey Milford, Oxford University Press, 1925.

This is a collection of the gleanings of a lifetime spent in the busy practice of surgery and surgical teaching. The author's experiences dates back to the pre-antiseptic era when he began practice. It is full of valuable pointers in diagnosis and suggestions in surgical technic. Throughout it shows the hand of the master surgeon and scholarly English gentleman, and proves a source of great enjoyment to one engaged in the practice of surgery.

Intestinal Tuberculosis, Its Importance, Diagnosis and Treatment. By Lawrason Brown, M.D., Chairman of the Medical Board of the Trudeau Sanatorium, Saranac Lake, New York, and Homer L. Sampson, Roentgenographer of the Trudeau Sanitarium, Saranac Lake, New York. 304 pages, illustrated with 112 engravings. Philadelphia and New York: Lea and Febiger. Cloth, $4.00.

The writers "deemed it a duty to collect in one volume such data as would enable one to diagnose or to exclude secondary intestinal tuberculosis in any stage." There is the most painstaking study of the subject with much statistical data so necessary for drawing accurate conclusions. The photographs, diagrams and roentgenograms add greatly to the usefulness of the book. It is the most complete monograph on the subject that has yet appeared.

Modern Methods of Diagnosis and Treatment of Pulmonary Tuberculosis. By R. C. Wingfield, M.D., M.R.C.P., Late Physician-in-Charge of the Tuberculosis Department, St. Thomas's Hospital; Medical Superintendent, Brompton Hospital Sanatorium, Frimley. 130 pages, illustrated. New York: Paul B. Hoeber, Inc., 1925.

In this English book the statistics of the occurrence of tuberculosis other than pulmonary in childhood are rather startling. The reviewer has no knowledge of any such American statistics. If they exist they should be forcibly brought to the attention of the American physician at large.

The chapters bring to the general practitioner the most modern methods in diagnosis and treatment of tuberculosis. The classification of tuberculosis is British and not that outlined by the National Tuberculosis Association of America, which is much to the detriment of the book.

Post-Mortem Appearances. By Joan M. Ross, M.B., B.S., (Lond.), M.R.C.S., L.R.C.P., Assistant Pathologist, St. Mary's Hospital. With preface by E. H. Kettle, M.D., Professor of Pathology and Bacteriology, Welsh National School of Medicine, Cardiff. 216 pages. London and New York: Humphrey Milford, Oxford University Press, 1925.

This small book is designed especially for those who may be called upon to do an occasional autopsy. "It describes the chief anatomical changes found in the commoner diseases." These are taken up in regular order under the various systems chiefly involved in the disease. The book is very well done and contains much of value, even to the specialist in pathology.

Radiography. A Manual of X-Ray Technique, Interpretation and Therapy. By Charles D. Enfield, M.D., F.A.C.P., Roentgenologist to St. Anthony's Hospital and Norton Memorial Infirmary, Louisville, Ky. 299 pages, with 194 illustrations. Philadelphia: P. Blakiston's Son & Co. Cloth, $10.00.

This is a very limited treatise, but undoubtedly has a place in medical literature.

Chapter 4 is a well formed description of all types of necessary apparatus. It merges delightfully into Chapters 5 and 6, where accessories and tubes are described, and the reader is guided in his selection. Dark-room technic is simplified in Chapter 7, which should be of great value. Chapter 9, on protection to operator and patient, is definitely worthy of note, is most essential and well expressed.

The rest of the book is allotted to the technic of making roentgenograms and their interpretation, including bones, positions and exposures for bones, thorax, kidneys, ureters, bladder, gastro-intestinal tract, sinuses, antra, and teeth.

While the accurate differentiations could not be given here, the author's efforts will succeed in conveying a general knowledge to the busy practitioner.

The Surgical Clinics of North America (issued serially, one number every other month). Vol. V, No. 6. Philadelphia Number, December, 1925. 223 pages, with complete index to Volume 5, and 50 illustrations. Per clinic year (February, 1925, to December, 1925.) Philadelphia and London: W. B. Saunders Co. Paper, $12.00; cloth, $16.00 net.

The "Philadelphia Number" of these clinics, which have won a justifiable reputation for themselves, contains the clinics of Drs. John B. Deaver, C. H. Frazier, F. G. Grant, G. P. Muller, Brooke M. Anspach, Leon Herman and H. L. Northrop. Gall bladder and general abdominal conditions receive considerable attention, as well as gynecological, urological, and brain surgery. Fractures furnish the main large omission from this number. They have, however, been dealt with in preceding numbers.

Symptoms of Visceral Disease. A Study of the Vegetative Nervous System in Its Relationship to Clinical Medicine. By Francis Marion Pottenger, A.M., M.D., LL.D., F.A.C.P., Medical Director, Pottenger Sanatorium for Diseases of the Lungs and Throat, Monrovia, Cal.; Author of "Clinical Tuberculosis," "Tuberculin in Diagnosis and Treatment," "Muscle Spasm and Degeneration," etc. Third edition. With 86 text illustrations and 10 color plates. St. Louis: C. V. Mosby Co., 1925.

In this, the third edition of his work, the author has made slight changes from the text of the second edition, and has enlarged somewhat upon the views expressed in the two former volumes. The book is well written, but the author does not express his views clearly, and some of his ideas are not substantiated by the work of others. Many of the terms used are ambiguous.

The author has attempted to outline his view of the derivation through the nervous system of symptoms produced in disease.

Southern Medical News

ALABAMA

At the annual meeting of the Medical Association of the State of Alabama, which was held in Mobile, April 27-30, Dr. Aaron L. Harlan, Alexander City, was elected President; Drs. George A. Cryer, Anniston, Thomas Joseph Dean, Union Springs, Victor H. Williams, Jasper, and Kossuth A. Mayer, Lower Peach Tree, Vice-Presidents; Dr. Douglas L. Cannon, Montgomery, Assistant Secretary, and Dr. Jacob U. Ray, Jr., Woodstock, Treasurer.

The U. S. Bureau of Mines, cooperating with the U. S. Public Health Service, after making a survey of mining towns in Alabama, indicate that sanitation in these towns receives more consideration than in most of the other coal fields of the country. The sanitary rating covered by the survey varied from 43.75 to 95.50, and averaged 69.32.

Dr. George E. Blue, Montgomery, was elected President of the Alabama Power Company Surgeons at the annual meeting, May 12th, to succeed Dr. Aaron L. Harlan, Alexander City. Dr. Samuel R. Benedict, Birmingham, the Chief Surgeon, was presented with a watch by other members at this meeting.

Deaths

Dr. James Glenn Donald, Pineapple, aged 46, died April 21 of angina pectoris.

Dr. Tarley William Jones, Fayette, aged 51, died April 16 of pneumonia following influenza.

Dr. Malachi Coghlan, Tensaw, aged 65, died in December, 1925, of organic heart disease.

Dr. John A. Kimbrough, Thomasville, aged 54, died recently at a hospital in Birmingham.

Dr. John Thomas Masterson, Moulton, aged 80, died December 15, 1925, of influenza.

Dr. James Crawford Watson, Georgiana, aged 50, died March 15 of acute nephritis.

ARKANSAS

At the annual meeting of the Arkansas Medical Society, which was held in Hot Springs May 18-20, Dr. James M. Lemons, Pine Bluff, was elected President; Dr. Henry Thibault, Scott, President-elect; Drs. Grayson E. Tarkington, Hot Springs, Thomas F. Kittrell, Texarkana, and James H. Fowler, Harrison, Vice-Presidents; Dr. Royal J. Calcote, Little Rock, Treasurer, re-elected, and Dr. William R. Bathurst, Secretary-Editor, Little Rock, re-elected. The next annual meeting will be held in Little Rock.

The new building for advanced cases of tuberculosis, to replace the building recently destroyed by fire at the Arkansas Tuberculosis Sanatorium, will be completed in June.

A building being erected by the Ancient Order of United Workmen of Arkansas, which will be donated to the State for a general hospital, will be ready for occupancy in July.

Dr. A. C. Haney, Russellville, recently opened an Eye, Ear, Nose and Throat Hospital.

Dr. Wm. L. Holt, former City Health Officer of Little Rock, has exchanged positions with Dr. Austin F. Barr, Health Officer of Hot Springs.

Deaths

Dr. Clarence P. Battles, Hot Springs, aged 72, died March 31, at Girard, Pa.

Dr. Charles W. Culp, Mammoth Spring, aged 67, died April 8 of cerebral hemorrhage.

Dr. E. W. Davis, Lavaca, aged 57, died February 1 of carcinoma of the stomach.

Dr. Early E. Scott, Fort Smith, aged 45, died April 20.

Dr. John Shibley, Gentry, aged 77, died recently of hemorrhage, due to gastric ulcer.

DISTRICT OF COLUMBIA

The National Tuberculosis Association will hold its annual meeting in Washington, October 4-7, immediately following the meeting of the International Union Against Tuberculosis, which meets in the same city September 30-October 2. The sessions of the National Tuberculosis Association are open to all persons interested; those of the International Union Against Tuberculosis are open only to members. Further information about these meetings may be obtained from the National Tuberculosis Association, 370 Seventh Avenue, New York City.

The establishment of a Bureau of School Hygiene in the Health Department of the District of Columbia is proposed in a bill introduced May 3 by Congressman Begg, of Ohio. The bureau would provide medical examinations for all pupils in public and private schools of the district; medical examinations for teachers in public schools; sanitary inspection of schools and school equipment, and nutrition classes.

Hearings were held May 6 before a senate committee on the bill introduced by Senator Fletcher, of Florida, which would prohibit vivisection among dogs in the District of Columbia, the territories and our insular possessions. Among those who appeared in opposition to the bill were Dr. Reid Hunt, Professor of Pharmacology, Harvard University Medical School, Boston; Major Henry J. Nichols, Army Medical Corps; Lieut. Commander Joseph R. Phelps, Navy Medical Corps; John S. Buckley, Chief, Pathologic Division, Bureau of Animal Research; Alice C. Evans, Mrs. Ella A Enlows, Hygienic Laboratory, and Dr. Victor C. Vaughan, Chairman of the Medical Section of the National Research Council.

Major General Merritte W. Ireland has been reappointed by the President as Surgeon-General of the U. S. Army, and the appointment was confirmed by the Senate early in April.

Dr. Hubert Work, Secretary of the Interior, and former President of the American Medical Association, was reelected President of the Medical Veterans of the World War at the annual dinner at Dallas, Texas, in April.

Deaths

Dr. James T. Hoskins, Washington, aged 72, died March 15 following a long illness.

FLORIDA

The Sisters of Charity of St. Vincent de Paul are planning to establish a 200-bed hospital in Jacksonville.

The Lake County Medical Association has unanimously voted for the establishment of a hospital for the County. Traveres has been chosen as the place for the hospital.

A tentative plan for the new Winter Haven Hospital, Winter Haven, was recently presented to the physicians of the town by H. F. Hentz, Architect, Atlanta, Ga. The building under consideration is to be three stories high and to contain about twenty-four beds.

A permit was recently issued for the construction of a $1,129,000 municipal hospital on Davis Islands, near Tampa. The plans call for a six-story structure.

The Medical Arts Building Company, Tampa, an-

nounces that it will erect a twelve-story office building at the corner of Plant and Grand Central Avenues at a cost of about $1,200,000, which will be devoted exclusively to the use of physicians and dentists. The project, which is said to have been approved by the Hillsborough County Medical Society, has been financed and the site purchased, and nearly all the space in the building leased.

Dr. A. D. Ownbey, formerly of Newport News, Va., recently located in Miami, and has received an appointment on the surgical staff of the City Hospital.

Deaths

Dr. John A. Barnes, Tampa, aged 58, died March 1.

Dr. Geo. C. Kingsbury, Largo, aged 67, died suddenly May 19.

GEORGIA

Ben Hill County Medical Society has elected Dr. Thomas E. White, Fitzgerald, President; Dr. Charles Wilcox, Fitzgerald, Vice-President; Dr. L. S. Osborne, Fitzgerald, Secretary-Treasurer.

Coweta County Medical Society has elected Dr. T. B. Davis, Newnan, President; Dr. M. F. Cochran, Newnan, Vice-President; Dr. A. A. Barge, Newnan, Secretary-Treasurer.

Glynn County Medical Society has elected Dr. J. A. Dunwody, Brunswick, President; Dr. R. E. L. Burford, Brunswick, Vice-President; Dr. J. W. Simmons, Brunswick Secretary-Treasurer.

Gordon County Medical Society has elected Dr. Z. V. Johnston, Calhoun, President; Dr. R. B. Chaltain, Calhoun, Secretary-Treasurer.

Gwinnett County Medical Society has elected Dr. W. H. Hinton, Dacula, President; Dr. N. H. Pierce, Suwanee, Vice-President; Dr. D. C. Kelley, Lawrenceville, Secretary-Treasurer.

Laurens County Medical Society has elected Dr. Sidney Walker, Dublin, President; Dr. A. T. Coleman, Dublin, Vice-President; Dr. O. H. Cheek, Dublin, Secretary-Treasurer.

Macon-Taylor Counties Medical Society has elected Dr. R. C. Montgomery, Marshallville, President; Dr. D. B. Frederick, Marshallville, Vice-President; Dr. F. M. Mullino, Montezuma, Secretary-Treasurer.

Madison County Medical Society has elected Dr. H. G. Banister, Ila, President; Dr. W. D. Gholston, Danielsville, Secretary-Treasurer.

Monroe County Medical Society has elected Dr. B. L. Smith, Forsyth, President; Dr. R. C. Goolsby, Jr., Forsyth, Vice-President; Dr. W. J. Smith, Juliett, Secretary-Treasurer.

Murray County Medical Society has elected Dr. M. P. Bates, Ramhurst, President; Dr. R. H. Bradley, Chatsworth, Vice-President; Dr. E. H. Dickie, Chatsworth, Secretary-Treasurer.

Ocmulgee County Medical Society has elected Dr. W. A. Coleman, Eastman, President; Dr. R. L. Whipple, Cochran, Vice-President; Dr. Albert R. Bush, Hawkinsville, Secretary-Treasurer.

Polk County Medical Society has elected Dr. E. H. Richardson, Cedartown, President; Dr. T. E. McBryde, Rockmart, Vice-President; Dr. P. O. Chaudron, Cedartown, Secretary-Treasurer.

Second County Medical Society has elected Dr. J. A. Summerlin, Pelham, President; Dr. W. S. Cook, Albany, Vice-President; Dr. C. H. Watt, Thomasville, Secretary.

Seventh District Medical Society has elected Dr. W. E. Benson, Marietta, President; Dr. W. E. Wofford, Cartersville, Vice-President; Dr. M. M. McCord, Secretary.

Turner County Medical Society has elected Dr. H. M. Bellflower, Sycamore, President; Dr. F. W. Rogers, Ashburn, Vice-President; Dr. J. H. Baxter, Ashburn, Secretary-Treasurer.

Walton County Medical Society has elected Dr. H. L. Upshaw, Social Circle, President; Dr. J. B. H. Day, Social Circle, Vice-President; Dr. J. K. McClintic, Monroe, Secretary-Treasurer.

Wilkes County Medical Society has elected Dr. H. M. Sale, Ravle, President; Dr. O. S. Wood, Washington, Vice-President; Dr. H. T. Harris, Washington, Secretary-Treasurer.

On April 15th the Medical Societies of Burke, Jenkins and Richmond Counties held a joint meeting in the Masonic Temple at Waynesboro at which a delightful barbecue was served. The meeting was well attended and an excellent program presented.

Mr. A. S. Bourne, Augusta and New York, has donated to the Department of Internal Medicine of the University of Georgia School of Medicine $5,000 which will be used for the purchase of equipment.

The new Blackman Health Resort, Atlanta, succeeding the Blackman Sanatorium was opened March 29.

A campaign for funds is being carried on for Georgia's new hospital for the Junior Order, United American Mechanics. The hospital is to be erected on a site on the south side of Atlanta. It is proposed to make an initial expenditure of $150,000 in building the hospital and in addition to raise $100,000 for endowment and maintenance.

The contract for the construction of a $400,000 hospital for the Central of Georgia Railroad, at Savannah, was recently awarded, and construction will begin shortly.

The Clarke County Medical Society unanimously endorsed the resolutions of the American Medical Association in regard to the treatment of individuals and World War veterans by federal agents rather than by their local practicing physicians.

The Monroe Hospital, Monroe, Walton County, celebrated its first anniversary March 12.

Dr. H. A. Rogers, Jeffersonville, has been appointed physician and surgeon for the Macon, Dublin and Savannah Railroad.

Dr. J. Neal Willis, Atlanta, who was Resident Physician at Grady Hospital, will be associated with Blackman Health Resort.

Dr. L. A. Smith, Quitman, has been appointed Surgeon for the South Georgia Railroad.

Dr. C. J. Maloy, Helena, had the misfortune to lose his home, clothing, furniture and library by fire on April 9th.

Dr. Joseph R. Clemmons, Assistant Superintendent of the Macon Hospital, Macon, was recently named Superintendent to succeed Dr. C. L. Ridley, resigned. The position of Assistant Superintendent will remain vacant, according to the Trustees of the Hospital.

Dr. Hudnall G. Weaver is serving as temporary Health Officer of Macon, pending the selection of a successor to Dr. Charles L. Ridley, who resigned May 1 to become Medical Director of the Bankers' Health and Life Insurance Company.

Dr. William C. Humphries, Acworth, who has been appointed Health Officer for the City of Griffin and Spalding County, took up his new duties June 1.

Dr. John W. Oden, for eight years on the staff of the Georgia State Sanitarium, Milledgeville, has resigned to accept a position with the Children's Hospital for the Feeble-Minded in Augusta.

Miss Lillian Kinnedy announces the opening of a studio at the Academy of Medicine, Atlanta, for the making of anatomical, pathological, operative technique and other scientific drawings.

Dr. Henry G. Mealing and Miss Lillie May Glover, both of Augusta, were married March 21.

Deaths

Dr. J. W. Blosser, Atlanta, aged 81, died April 11th.

Dr. David Edward Dudley, Savannah, aged 55, died March 20 at White Bluff of acute nephritis and acute myocarditis.

Dr. Ashton T. Ford, Sylvester, aged 60, was killed May 2 by an assailant.

Dr. Wallace Matthews, Quitman, aged 59, was found dead in his office March 11th.

Dr. J. A. McCrea, Tifton, aged 77, died March 24th after a long illness.

KENTUCKY

Construction work has started on the new Deaconess Hospital at Covington.

The Good Samaritan Hospital, Lexington, has let the contracts for a $300,000 four-story addition to be erected on South Limestone Street.

A tag day is to be held June 12 under the auspices of the Circle of Mercy of St. Elizabeth, Covington, for the purpose of liquidating the debt of the Hospital.

Mrs. Lucas Combs, Lexington, recently donated a radio with twenty-five sets of head phones to the Good Samaritan Hospital, Lexington, in memory of her father, General Roger Williams, who was an enthusiastic radio fan.

The Health Officer of Charlestown closed the schools on April 22 because of five cases of smallpox.

Dr. Ralph Holt, Grahamville, has been elected County Physician of McCracken County for four years, to succeed Dr. Louis E. Young, Milan.

(Continued on page 34)

BLENDING PATCH'S COD LIVER OIL FOR UNIFORMITY

It has long been recognized that cod livers collected at a given point vary in quantity and quality at different seasons of the year. Fortunately we do not depend upon one locality as our source of fresh liver supply and when the season is "off" at one plant it is running strong at another.

By operating plants over a large territory we are able to maintain continuous production regardless of "seasons." Accordingly we are able to supply cod liver oil of high potency throughout the year.

As soon as our oil is made from fresh livers at our many plants along the Atlantic Coast it is shipped to our main plant at Gloucester, Mass.

Here the oil from our various plants is thoroughly mixed in large blending tanks. This insures a uniform product throughout the year.

Just as the coffee roaster blends his coffees and the miller his wheat, the blending of cod liver oil is an important step in producing PATCH'S FLAVORED COD LIVER OIL.

The U. S. P. Assay.

Nearly four years before the U. S. P. Vitamin Assay became official, we were biologically testing each lot of PATCH'S FLAVORED COD LIVER OIL in our research laboratory, for your protection.

Let us send you a sample of this dependable product.

Taste It! You'll be surprised!

THE E. L. PATCH CO.

Research Laboratory

Stoneham 80, Boston, Mass.

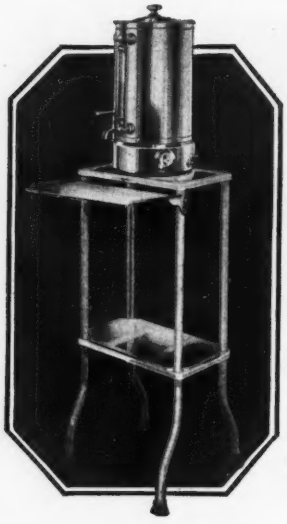
The E. L. Patch Co.
Stoneham 80, Boston, Mass.

Send me a sample of Patch's Flavored Cod Liver Oil with literature.

Dr. .....

St. & No. .....

City and State..... SMJ



This Outfit Keeps You In Hot Water Sterile to the Last Drop

Every drop of water in this PELTON Sterilizer is absolutely sterilized. Once boiled, it is impossible to draw off unsterile water. Because there isn't any—in boiler, gauge or faucet.

As the water is boiled, it is forced through the gauge, back into the boiler and boiled again. Absolute protection is thus assured.

The Sterilizer heats water instantly, and will boil two and one-half gallons in twenty-eight minutes.

On its neat tubular stand, it is convenient as well as safe. With stand, $65—without stand, $48.

Details gladly sent, without obligation.

THE PELTON & CRANE COMPANY
DETROIT, MICHIGAN

PELTON

Indestructible Sterilizers

(Continued from page 582)

Deaths

Dr. Allen P. Banfield, Catlettsburg, aged 75, died April 16 at the King's Daughters' Hospital, Ashland, of pneumonia.

Dr. Jasper Franklin Bryant, Louisville, aged 62, died April 20 of uremia.

Dr. Carlos A. Fish, Frankfort, aged 51, died May 12.

Dr. John W. Forrest, Lynnville, aged 72, died January 14 of chronic nephritis.

Dr. James M. Grant, Petersburg, aged 73, died March 24 of paralysis.

Dr. Charles J. Lockhart, Owensboro, died April 6.

Dr. Miles Cabel McKee, Whitesburg, aged 43, died April 20.

Dr. John James Mudd, Hardyville, aged 80, died April 12 of senility.

Dr. James W. Parker, Gray, aged 58, died April 21 of nephritis.

Dr. Alton J. Turney, Crutchfield, aged 57, died April 13 of heart disease.

Dr. Elonzo A. Whitlow, Scottsville, aged 49, died April 3 at the Blackburn Hospital, Bowling Green, of a skull fracture received in an automobile accident.

Dr. William J. Zinn, Sherman, aged 95, died April 21 of heart disease.

LOUISIANA

Lafayette Parish Medical Society has elected Dr. A. J. Comeaux, Youngville, President; Dr. L. B. Long, Scott, Vice-President; Dr. Harold G. F. Edwards, Lafayette, Secretary-Treasurer, re-elected.

Lafourche Parish Medical Society has elected Dr. F. T. Gouaux, President; Dr. C. J. Barker, Vice-President; Dr. P. Dansereau, Secretary-Treasurer.

Lafourche Valley Medical Society has elected Dr. J. J. Ayo, President; Dr. W. W. Pugh, Vice-President; Dr. P. Dansereau, Secretary-Treasurer.

Hotel Dieu has established an Electrocardiographic Department, in charge of Dr. A. E. Fossier.

Dr. Robert Theodore Lucas, Shreveport, and Miss Ruth Romaine Dudley, Plano, Texas, were married March 23.

Deaths

Dr. Marion Herbert McGuire, New Orleans, aged 52, died May 6.

Dr. Henry Clinton Peninger, Lacamp, aged 49, died recently at Glenmora of chronic interstitial nephritis.

MARYLAND

At the one hundred and twenty-eighth annual meeting of the Medical and Chirurgical Faculty of Maryland held April 27-29 at Baltimore, Dr. Thomas S. Cullen was elected President; Drs. John L. Riley, Snow Hill, Standish McCleary, Baltimore, and Frank W. Keating, Owings Mills, Vice-Presidents; Dr. Joseph Albert Chatard, Baltimore, Secretary; Dr. Charles E. Brack, Baltimore, Treasurer.

Dr. William H. Welch, Director, John Hopkins School of Hygiene and Public Health, gave the opening address at the Regional Institute for Tuberculosis workers April 12. Meetings were held twice daily for about two weeks and attended by persons engaged in tuberculosis work in Maryland, Pennsylvania, New Jersey, New York, West Virginia, South Carolina, Colorado and the District of Columbia.

Sponsored by the American Child Health Association, a program to improve child health was presented throughout the State during May. Dr. James H. Mason Knox, Jr., was Chairman of a committee of ninety who endeavored to obtain a widespread cooperation in carrying out the program.

Johns Hopkins University Medical School, Baltimore, has created the position of Secretary, to which Lawrence H. Baker, Ph.D., has been appointed. Dr. Baker will also act as Registrar of the medical school.

Dr. Walter Ernest Dixon, Professor of Materia Medica and Pharmacology, Kings College, University of London, delivered the fourth series of lectures of the Charles E. Dohme Lectureship at the Johns Hopkins School of Hygiene and Public Health May 7-10.

Dr. J. Percy Wade, Superintendent of the Spring Grove State Hospital, Catonsville, has announced that ground was broken on April 10 for the new Arthur D.

(Continued on page 36)

Orthopedics Requires

the use of

Photography *and* Radiography

A fractured femur will be set on the basis of radiographic findings but the history is recorded photographically.

Eastman *Dupli-Tized* X-Ray Film may be depended on for the radiographic evidence and Eastman Portrait Film, *Super-Speed* is ideal for the photographic record.

Eastman Kodak Company

Medical Division Rochester, N. Y.

If you have not received our interesting catalogue, ask us for one. It is worthy of a place in your files.

Urological Instruments
In
Rubber and Gum

Ask your dealer

C. R. BARD, Inc.
37-39 East 28th St., New York

(Continued from page 34)

Foster Psychopathic Diagnostic Clinic at the Hospital. The new building will accommodate 250 patients and will be ready for occupancy in October, 1927.

A dance recital recently sponsored by the Children's Hospital Club netted $43 for the children's ward of the Emergency Hospital, Annapolis.

Commencement exercises of the Mercy Hospital School of Nursing, Baltimore, were held May 11 at the new auditorium. Twenty-eight nurses were graduated.

Dr. Worth B. Daniels, son of the former secretary of the Navy, has been appointed an intern at Johns Hopkins Hospital. Mr. Edmond B. Kelly and Mr. Christopher Johnston, senior students at the John Hopkins Medical School, have also received appointments as interns. Mr. Kelly is a son of Dr. Howard A. Kelly, and Mr. Johnston is the grandson of the late Dr. Christopher Johnston.

Dr. Victor F. Cullen, Sabillasville, and Miss Ethel Bell, of Texas, were married May 19.

Deaths

Dr. Frederick E. Fooks, Baltimore, aged 77, died March 25.

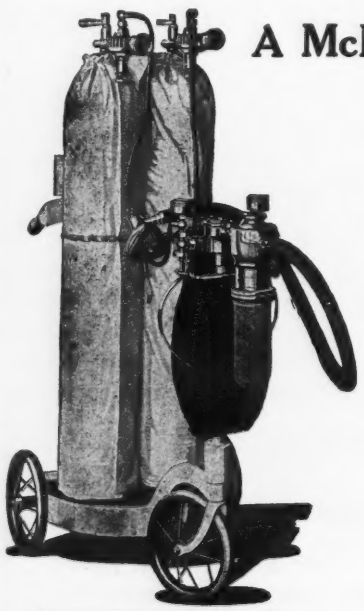
Dr. William Franklin Taylor, Laurel, aged 71, died April 26 of heart disease.

MISSISSIPPI

The Woman's Auxiliary of the Mississippi State Medical Association met in Jackson May 11. The following officers were elected: Mrs. W. H. Frizell, Brookhaven, President-elect; Mrs. C. A. Sheely, Gulfport, First Vice-President; Mrs. A. G. Payne, Greenville, Second Vice-President; Mrs. Henry Boswell, Jackson, Secretary; Mrs. S. E. Dunlap, Wiggins, Treasurer.

A $20,000 nurses' home is being planned for the Charity Hospital, Jackson, according to a recent announcement of Dr. David Walley, Superintendent. The State Legislature has appropriated $10,000 for the home and the remainder was donated. The portion of the Hospital now used for nurses' quarters will be converted into maternity and children's wards.

(Continued on page 38)



McKesson Universal Unit No. 100

A McKesson Makes You Confident

At all times you have accurate control for maintaining the correct mixture for the patient; as well as convenient regulation not only of the mixture but of the pressures under which the gases are administered at the inhaler, regardless of the amount of gases the patient may require.

Send for Catalog No. 15

It Tells You Why and How

McKesson Apparatus

Will Solve Your Gas-Oxygen Problems

TOLEDO TECHNICAL APPLIANCE CO.

2226 Ashland Ave. Toledo, Ohio

A NEW BOOK

"Varying the Monotony of Liquid and Soft Diets"

URE unflavored gelatine is of such importance in the hospital dietary that we have had prepared by a noted dietetic authority a booklet showing the many ways Knox Sparkling Gelatine—the highest quality for health—may be used to make the monotonous diets constantly attractive and more nourishing.

The booklet contains complete recipes for easy and economical preparation, calculations of protein, fat, carbohydrates and calories, with a special chapter on Tonsillectomy Diet.

At the recent Convention of the American Medical Association at Dallas, Texas, many attending members pronounced this book one of the most helpful contributions made to dietetic practice.

A Contribution to Medical Practice

Every surgeon, physician, dietician and nurse should have a copy of this important contribution to dietetic practice.

Sufficient copies for distribution to the staff of any hospital will be sent complimentary, upon request.

KNOX
SPARKLING
GELATINE
"The Highest Quality for Health"

Knox Sparkling Gelatine is prepared by the most exact methods under constant bacteriological control. It is free from sugar, artificial coloring or flavoring, and may be prescribed with absolute dependence on its uniform purity and quality.

Send This Coupon

Register your name with this coupon with the laboratory reports on the dietetic value of Knox Sparkling Gelatine

KNOX GELATINE LABORATORIES
408 Knox Avenue, Johnstown, N. Y.

Please register my name to receive, without charge, your recipe booklet, "Varying the Monotony of Liquid and Soft Diets," also the results of past laboratory tests with Knox Sparkling Gelatine, and future reports as they are issued.

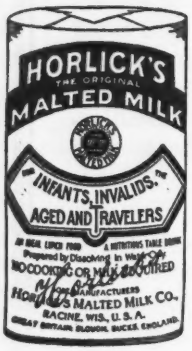
.....

.....

.....

In Sickness—or in Health

Horlick's *the Original* Malted Milk



Delicious—
Nourishing—
Easily Digested

For more than a third of a century, Horlick's Malted Milk has been the standard of purity and food value among physicians, nurses and dietitians.

Write for free samples and literature.

Avoid Imitations **Prescribe the Original**

Horlick's Malted Milk Corporation
RACINE, WISCONSIN

A SEASONABLE SUGGESTION

Experience has shown the great value of lactic cultures in infant entero-colitis, difficult feeding cases and colic of the breast-fed baby.

B. B. CULTURE may be used with confidence wherever this treatment is indicated.

B. B. CULTURE LABORATORY, INC.

Yonkers, New York

(Continued from page 36)

Deaths

Dr. Baron D. Bishop, Monticello, aged 74, died March 30.

Dr. Hyman M. Folkes, Biloxi, aged 55, died May 1 of cerebral hemorrhage.

MISSOURI

At the eighth annual meeting of the Western Physiotherapy Association held at Kansas City April 15-16, Dr. Lynne B. Green, Kansas City, was elected President; Dr. J. E. G. Waddington, Detroit, Mich., First Vice-President; Dr. O. M. Moore, York, Neb., Second Vice-President; Dr. Charles Wood Fassett, Kansas City, Secretary; Dr. W. P. Grimes, Kansas City, Treasurer. The next meeting will be held in Kansas City April, 1927.

Schuyler County Medical Society has elected Dr. J. H. Keller, Lancaster, President; Dr. H. E. Gerwig, Downing, Vice-President, reelected; Dr. J. B. Bridges, Downing, Secretary-Treasurer, reelected.

The next regular meeting of the State Board of Health for the examination of applicants to practice medicine will be held in St. Louis at the St. Louis University on June 28-July 1.

Plans have been drawn for a hospital at Washington to be operated by the Sisters of St. Francis.

Missouri Odd Fellows plan to construct a hospital for members of the organization and their families. Definite plans have not yet been made but it is thought that the hospital will be located in the southeastern part of the State.

St. Mary's Hospital, Kansas City, recently announced a $500,000 building program, to include a $250,000 nurses' home with a capacity of 117 nurses, a boiler and refrigerating plant and laundry to cost $100,000 and additions to the Hospital proper.

The crowded conditions at the City Hospital, St. Louis, are compelling the authorities at that institution to create another ward for the care of the male tuberculosis patients. By decreasing the size of the present occupational therapy department, at least twenty additional patients may be taken care of.

Dr. Porter Williams, Boonville, has been appointed Superintendent of the General Hospital at Kansas City, and took charge of the institution on April 14. Dr. Williams has served for twelve years as Superintendent at three State hospitals, his last service being at State Hospital No. 2 at St. Joseph.

Dr. Cecil L. Wayman has been appointed Tuberculosis Controller of St. Louis by the Hospital Commissioner.

Dr. Homer F. White has been appointed Superintendent of the General Hospital, Kansas City, to succeed Dr. T. A. Kyner.

Dr. David P. Ferris, St. Louis, has been appointed Chief Oto-laryngologist at Alexian Brothers' Hospital and Director of the Department at Alexian Brothers' Dispensary.

In a reorganization of the Health Department of Kansas City by the Director of Health, Dr. Ernest W. Cavaness, Dr. Leonard Mason Lyons was appointed City Epidemiologist, and Dr. John L. Lavan, Commissioner of Child Hygiene and Communicable Diseases.

Dr. Howard M. Smith, negro physician, Kansas City, has been appointed head of the old City Hospital where negro patients are cared for.

Deaths

Dr. John W. Coy, Bolivar, aged 56, died April 6 of broncho-pneumonia.

Dr. William O. Dunlap, Sedalia, aged 82, died April 17 at the Robinson Sanitarium, Kansas City, of general debility.

Dr. Oscar Emmett Gourley, Bado, aged 61, died April 16 of pneumonia.

Dr. Joseph Mayo Harris, Sedalia, aged 67, died March 29 of heart disease.

Dr. James Alvin Minor, San Antonio, aged 62, died April 20 of uremia.

Dr. Thomas F. McGlasson, Lewistown, aged 64, died May 3 at the State Hospital No. 1, Fulton.

Dr. Lemuel Franklin O'Bryant, Breckenridge, aged 50, died recently of endocarditis.

Dr. Fleming L. Phillips, Portageville, aged 55, was shot and killed May 1.

(Continued on page 40)

TO BREAK THE CATHARTIC HABIT

PETROLAGAR has been accepted for New and Nonofficial Remedies by the Council on Pharmacy and Chemistry of the American Medical Association.

PETROLAGAR is issued as follows:

PETROLAGAR (plain)

PETROLAGAR (With Phenolphthalein)

And restore normal tone to the sluggish bowel, constitutes the great difficulty in the treatment of habitual constipation.

The evils of the cathartic are obvious. It does not attempt to treat, it merely offers temporary relief.

But at what a price!

For the penalty exacted by the cathartic is the penalty of chronic constipation and the institution of the cathartic habit.

There is a rational way in which the bowel can be taught to move normally and at regular intervals, without hurting it.

This can be accomplished by diet, exercise and the use of a mechanical aid to re-educate the bowel.

PETROLAGAR is issued as the ideal mechanical aid in this condition.

PETROLAGAR presents an emulsification of pure mineral oil with agar-agar.

It is palatable, mixes intimately with the feces, and produces a soft, easily moved mass.

Deshell Laboratories, Inc.

536 Lake Shore Drive
CHICAGO, ILL.

Dept. S. M.

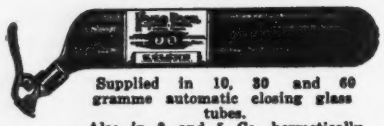
189 Montague Street
BROOKLYN, N. Y.

Petrolagar

Reg'd. U. S. Pat. Office

KELENE Pure Ethyl Chloride

For Local and General
ANESTHESIA



Supplied in 10, 30 and 60 gramme automatic closing glass tubes.
Also in 3 and 5 Cc. hermetically sealed glass tubes.

The automatic closing tubes require no valve. Simply press the lever.

Manufacturers

FRIES BROS.
92 Reade St., New York

Sole distributors for the U. S. and Canada

MERCK & CO.
St. Louis New York Montreal

DUO SURGEONS' ADHESIVE
has
Stick-to-it-tiveness

Attach your dressing all around the wound for best protection.

For wounds on the scalp, face, neck and limbs, for burns and bruises where you want a dressing only where required, and without a cumbersome bandage use this liquid adhesive.

They won't slip or flap.

They come off without solvents.

It is very economical as only a very thin film is painted on the skin.

$2.00 Bottle

Send for literature

Van Antwerp's
THE BEST ONLY

SURGICAL, HOSPITAL AND LABORATORY SUPPLIES

MOBILE :—: ALABAMA

(Continued from page 38)

Dr. Nathaniel Saenger, St. Louis, aged 53, died April 28 of melano-sarcoma of the scalp.

Dr. Sterling P. Stowers, North Kansas City, aged 64, died April 21, at Sedalia, of pneumonia.

NORTH CAROLINA

Dr. Charles L. Minor, Asheville, an ex-President of the Southern Medical Association, was one of five distinguished citizens of North Carolina to receive an honorary degree from the University of North Carolina at its one hundred and thirty-first commencement early in June.

Sixth District Medical Society has elected Dr. Thurman D. Kitchin, Wake Forest, President; Dr. Burton W. Fassett, Secretary.

North Carolina physicians will have the opportunity this summer of attending lectures and clinics conducted by specialists under the auspices of the University Extension Division in each of six different cities for two hours once a week for twelve weeks. The courses have been offered to ten cities, and the six that first procure the fifteen signatures of physicians required will receive the courses. The instructors will be Dr. Howard B. Sprague, Boston, diseases of the heart; Dr. Edward S. Emery, Jr., Boston, diseases of the gastro-intestinal tract, and Dr. Dwight O'Hara, Waltham, Mass., diseases incident to middle and old age.

A wing of the State Hospital for the Insane at Raleigh was destroyed by fire April 10 at a loss estimated at $500,000. The patients were all moved without injury to any one. The wing destroyed was built in 1853.

The North Carolina State Institution for the Blind has let the contract for the new hospital for which the last legislature authorized an appropriation of $50.000.

Dr. S. Dace McPherson, Durham, announces the opening of a private hospital, the McPherson Hospital, for the treatment of diseases of the eye, ear, nose and throat.

The Colwell Hospital Company, of which Dr. Lester A. Colwell is President, has secured the property of the former Lincolnton Hospital, which will be remodeled and enlarged. Dr. Robert W. Petrie, Charlotte, assumed direction of the Hospital June 1.

Sister Gertrude, former Mother Superior at St. Leo's Hospital, Greensboro, for seven years, has assumed the duties of Superintendent of St. Mary's Hospital, Rochester, N. Y., succeeding Sister Catherine, who was transferred to St. Vincent's Infant Asylum, Baltimore.

Dr. Hamilton W. McKay, Charlotte, has been elected President of the Charlotte Rotary Club.

Dr. Thurman D. Kitchin, since 1917 Professor of Physiology and Pharmacology, and since 1919 Dean at the Wake Forest College School of Medicine, Wake Forest, has tendered his resignation to the Board of Trustees, effective at the close of the present term. Dean Kitchin plans to return to his former home, Scotland Neck, to resume the practice of medicine.

Deaths

Dr. William I. Sumner, Randleman, aged 56, died May 6.

Dr. John Whitehead, Salisbury, aged 70, died suddenly April 15 of heart disease.

Dr. John R. Woltz, Dobson, aged 85, died April 10.

OKLAHOMA

Dr. F. E. Sadler, Henryetta, has been appointed City Physician.

Dr. W. E. Floyd, Muskogee, has been appointed City Superintendent of Health, vice Dr. F. W. Ewing.

Dr. W. M. Gallaher, Shawnee, was elected President of the Shawnee Rotary Club at its annual meeting in March.

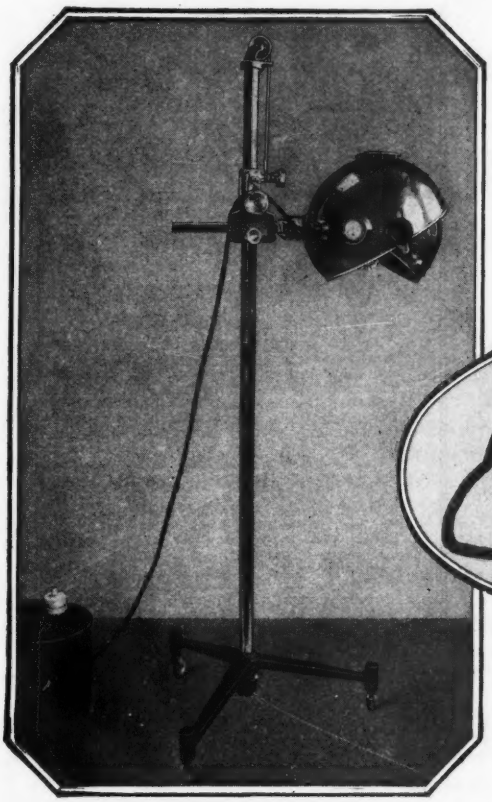
Dr. I. C. Wolfe, Muskogee, has been appointed City Physician, taking the place of Dr. Charles E. White, resigned.

Dr. Ralph V. Smith and Miss Ruth Dunlop, both of Tulsa, were married April 27.

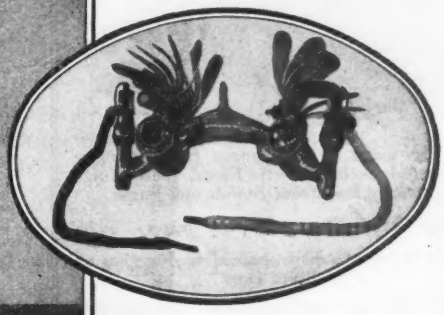
Deaths

Dr. James J. A. Edwards, Yeager, died recently of paralysis.

(Continued on page 42)



For Effective Radiation— *look to the Burner*



The HANOVIA BURNER *used in the* ALPINE SUN LAMP. *It is of the entire quartz mercury anode type.*

To a considerable degree the premier position of the ALPINE SUN LAMP in the field of ultraviolet therapy is the reward of years of continual improvement in mechanical features. Yet if any particular feature is to be accredited for such marked distinction, it is the HANOVIA BURNER.

The HANOVIA BURNER is of the entire quartz mercury anode type. Constant tests with this type of burner reveal that it generates a maximum intensity of ultraviolet rays for therapeutic application. This is confirmed by the use of the ALPINE SUN LAMP in cases where the production of powerful erythema is indicated. Also traceable to the ingenious construction of the burner is the longer service life and lower operating cost of this Lamp.

HANOVIA CHEMICAL & MFG. CO.

Main Office and Works: Chestnut Street & N. J. R. R. Avenue, Newark, N. J.

Branch Offices:

NEW YORK
30 Church Street

CHICAGO
30 N. Michigan Avenue

SAN FRANCISCO
220 Phelan Building

Gentlemen:

Please send me, without obligation, data and reprints upon the application of Quartz Light to general practice.

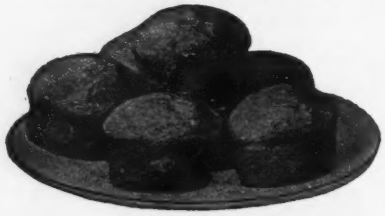
38

DR.

STREET. CITY. STATE

Listers

DIABETIC MUFFINS



Easily made in any home from *Listers* prepared casein Diabetic Flour. (Self-rising) Strictly free from Starch and Sugar.

Large Carton Flour *(30 days' supply)* $4.85

May be purchased from leading druggists or direct from

LISTER BROS., Inc. 405 Lexington Ave. NEW YORK CITY

(Continued from page 40)

Dr. James Hall, Wann, aged 86, died April 4 of pneumonia following influenza.

SOUTH CAROLINA

Cherokee County Medical Society has been reorganized and the following officers elected: Dr. W. L. Poole, President; Dr. Walter Boone, Vice-President; Dr. P. H. Smith, Secretary, all of Gaffney.

The Woman's Auxiliary of the Lexington County Medical Society has elected Mrs. W. P. Timmerman, Batesburg, President; Mrs. W. T. Gibson, Batesburg, Vice-President; Mrs. J. H. Mathias, Lexington, Secretary-Treasurer.

Deaths

Dr. Dargan Strother Pope, Columbia, aged 75, died April 26.

TENNESSEE

At the annual meeting of the Tennessee State Medical Association held in Memphis May 11-13, Dr. Ernest R. Zemp, Knoxville, was elected President; Drs. Thomas B. Yancey, Kingsport, William F. Cannon, Fayetteville, and James L. Dunavant, Henning, Vice-Presidents; Dr. John O. Manier, Nashville, Treasurer; Dr. Joseph F. H. Gallagher, Nashville, Secretary-Editor.

Cocke County Medical Society has elected Dr. E. E. Northcut, Newport, President; Dr. J. E. Hampton, Newport, Secretary.

Dyer County Medical Society has elected Dr. J. D. Brewer, Dyersburg, President; Dr. J. W. Wynne, Newbern, Vice-President; Dr. Lyle Motley, Dyersburg, Secretary-Treasurer.

Giles County Medical Society reorganized and has elected Dr. J. K. Blackburn, Pulaski, President; Dr. James A. LaRue, Pulaski, Secretary; Dr. George D. Butler, Pulaski, Treasurer.

Greene County Medical Society has elected Dr. L. E.

(Continued on page 44)

RADIUM RENTAL SERVICE

BY

THE PHYSICIANS RADIUM ASSOCIATION of CHICAGO, Inc.

Incorporated under the laws of Illinois, not for profit, but for the purpose of making radium available to Physicians to be used in the treatment of their patients. Radium loaned to Physicians at moderate rental fees, or patients may be referred to us for treatment if preferred.

Careful consideration will be given inquiries concerning cases in which the use of Radium is indicated

THE PHYSICIANS RADIUM ASSOCIATION

1100 Tower Bldg., 6 N. Michigan Ave.

CHICAGO, ILL.

Telephones:
Central 2268-2269

Mangaing Director:
Wm. L. Brown, M.D.

BOARD OF DIRECTORS

William L. Baum, M.D.
Frederick Menge, M.D.
Wm. L. Brown, M.D.
Walter S. Barnes, M.D.
Louis E. Schmidt, M.D.

RESULTS

The average feeding case will thrive and develop normally on correct formulae of carbohydrate, water and

Cow's Whole Milk or Klim

KLIM is regarded by many physicians as the cow's whole milk of choice because---

It is uniform as to composition---low in bacteria count---safe and practical.

Its finely divided casein, precipitating in a small friable curd, and its small butter globule promote digestion and induce a high rate of assimilation. The full nutritive values of cows milk are preserved in KLIM.

Fundamental Bases for Every Formula:

Merrell-Soule POWDERED PROTEIN MILK

Based on the original formula. Recognized as the protein milk of choice by the hundreds of pediatrists who have used it continuously for five years. Prepared in home and hospital with equal facility.

: : KLIM : : POWDERED WHOLE MILK

as cow's whole milk in your formulae!

--assures accuracy

--is easy to prepare

--always uniform and pure.

Merrell-Soule Powdered Whole Lactic Acid Milk

Correct in composition and acidity, possesses all the qualities of a hospital formula. Easy to prepare in the home. The desired friable curd is an inherent characteristic. A demonstrated clinical success.

Literature and samples sent promptly upon request.

Recognizing the importance of scientific control, all contact with the laity is predicated on the policy that KLIM and its allied products be used in infant feeding only according to a physician's formula.

M. S.

MERRELL-SOULE CO.
SYRACUSE, N. Y.

In Canada KLIM and its allied products are made by Canadian Milk Products, Ltd., 374 Adelaide Street, West, Toronto.

HEMOGLOBINOMETER — DARE ALUMINUM — This instrument lends itself equally to the Pathologist in the Hospital and to the practicing Physician.

The application and the technic of examination are described in all works of Hematology and Clinical Diagnosis.

For sale by all Supply Houses. Ask for descriptive circular.

RIEKER INSTRUMENT CO., Sole Mfrs.
1919-1921 Fairmount Ave., Philadelphia, Pa.

HIGH POWER
Electric Centrifuges

Send for IEC Cat Cn

INTERNATIONAL EQUIPMENT CO.
253 Western Ave., Boston, Mass.

(Continued from page 42)

Dyer, Greeneville, President; Dr. H. M. Taylor, Greeneville, Vice-President, and Dr. M. A. Blanton, Mosheim, Secretary-Treasurer.

Macon County Medical Society has elected Dr. J. Y. Freeman, Lafayette, President; Dr. Patterson East, Lafayette, Secretary; Dr. D. D. Howser, Lafayette, Assistant Secretary.

Marshall County Medical Society has elected Dr. S. A. Moffitt, Cornersville, President; Dr. J. A. Hardison, Lewisburg, Secretary; Dr. S. T. Hardison, Lewisburg, Treasurer.

Montgomery County Medical Society has elected Dr. M. L. Hughes, President; Dr. I. E. Hunt, Vice-President; Dr. H. A. Nesbitt, Secretary-Treasurer, all of Clarksville.

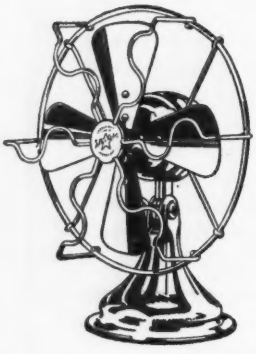
Morgan County Medical Society reorganized and has elected Dr. Arthur Byrd Warburg, President; Dr. W. E. Gallion, Oakdale, Secretary-Treasurer.

McMinn County Medical Society reorganized and has elected Dr. J. R. Nankivell, Athens, President; Dr. W. S. Moore, Etowah, Vice-President; Dr. E. M. Akins, Etowah, Secretary-Treasurer.

Tipton County Medical Society has elected Dr. H. C. Currie, Burlison, President; Dr. J. J. Flemming, Atoka, Vice-President; Dr. L. J. Lindsey, Covington, Second Vice-President; Dr. B. V. Dickson, Covington, Secretary-Treasurer.

(Continued on page 46)

EQUIP YOUR OFFICE AND HOSPITAL
with
STAR-Rite Electric Fans
WHEN SUMMER COMES



New
A Full Size
8" FAN
only
$6.50

Improved 10"
Oscillating
FAN
$13.50

Universal or Induction Motor

This is the first time in the history of electric fans that you have been able to buy a full size 8" fan of genuine quality for so little—only $6.50.

This is that handsome "nickel fan" you saw so much last summer. It's just as handsome as ever, but improved in many ways—and it's lower in price than ever!

10" Straight Model $10.00

Write Us for Quantity Discounts to Hospitals

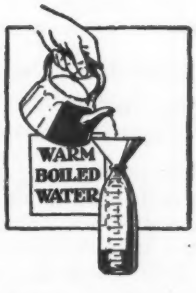
DOSTER-NORTHINGTON, Incorporated
BIRMINGHAM, ALABAMA

A Sterilized measuring cup is in each can

To each measure of S. M. A. Powder

ADD

An ounce of boiled water



Simple for the mother to prepare!

S. M. A. is simple for the mother to prepare. All that is necessary is to add boiled water. The physician is then sure the mother will carry out his instructions; it is simply a matter of adding a definite amount of boiled water to a definite amount of weighed or measured material.

Each feeding of S. M. A. in powdered form may be made up fresh, thus eliminating the need for ice. This coupled with the extremely low bacterial count of S. M. A. and the high quality of milk from which it is made is of decided advantage to infants deprived of breast milk, especially during the summer months.

In addition, S. M. A. prevents rickets and spasmophilia and gives excellent nutritional results in most cases.

Literature and liberal supply for trial sent upon request.

S. M. A. is manufactured by permission of The Babies and Childrens Hospital of Cleveland

by

THE LABORATORY PRODUCTS CO.
Cleveland, Ohio

Synthetic Milk Adapted to Breast Milk

Fine Products for SMA *the Infant's Diet*

TRADE MARK REG.

Paroxyl

Brand of
Acetylamino-oxyphenylarsonic Acid

Indicated in amebic dysentery, dysenteriae cysts and encysted flagellates.

Adult dose is 0.25 Gm., administered by mouth three times daily, for a period of one week. Paroxyl is manufactured by the H. A. Metz Laboratories, Inc., and marketed in bottles of 30 tablets of 0.25 Gm. each at $2.75.

Literature on request.

H. A. METZ LABORATORIES, INC.
122 HUDSON ST. NEW YORK

(Continued from page 44)

Tri-County Medical Society, composed of Humphreys, Hickman and Dickson Counties, has been organized, and their meetings are being well attended.

Warren Medical Society reorganized and has elected Dr. Elbert L. Mooneyham, Rock Island, President; Dr. John S. Harris, McMinnville, Secretary.

Washington County Medical Society has elected Dr. E. B. Bowery, President; Dr. R. St. Elmo, Murray, Vice-President; Dr. C. W. Friberg, Secretary-Treasurer, all of Johnson City.

At the annual election of officers of the Woman's Hospital of Memphis the following were elected: Dr. E. D. Mitchell, President; Dr. W. T. Black, Vice-President; Dr. Arthur R. Porter, Jr., Secretary.

The annual meeting of the West Tennessee Medical and Surgical Association was held at Jackson, May 27-28 under the presidency of Dr. Eugene M. Holder, of Memphis.

Dr. Theodore Davis, Nashville, has been elected Resident Physician of the Nashville General Hospital to succeed Dr. B. B. Sory, of Springfield, resigned.

Dr. Daniel N. Williams and Miss Frances Blair, both of Chattanooga, were married recently.

Deaths

Dr. Thomas Edward Abernathy, Chattanooga, aged 59, died in February.

Dr. W. J. Barker, Trenton, aged 50, died recently following an attack of pneumonia.

Dr. G. W. Callis, Dyer, aged 75, died February 23.

Dr. Hubert Wadlington Harris, Cleveland, aged 31, died March 29 following an appendectomy.

Dr. William Lafayette Henderson, Woodstock, aged 53, died March 2 at the Baptist Memorial Hospital, Memphis, of uremia.

Dr. Andrew J. McClarney, Crossville, aged 27, died March 12.

Dr. William C. Looney, Normandy, aged 69, died March 31.

Dr. William Miller Orr, Chattanooga, aged 70, died March 8.

(Continued on page 48)

Allen H. Bunce, A.B., M.D., F.A.C.P. George F. Klugh, B.S., M.D. Raiford T. Warnock, M.D. Jackson W. Landham, M.D.

Laboratories of

Drs. Bunce, Landham and Klugh

ATLANTA, GEORGIA

DEPARTMENTS

PATHOLOGY BACTERIOLOGY—SEROLOGY X-RAY—RADIUM

These laboratories are equipped for making every test of clinical value in the diagnostic study of medical and surgical cases. Only standardized methods and technique are used.

In addition to the diagnostic study of cases there are adequate facilities for the x-ray and radium treatment of conditions in which these forms of treatment are indicated.

Containers for pathological specimens and information in reference to x-ray and radium work furnished upon request.

Address

DRS. BUNCE, LANDHAM AND KLUGH

65 Forrest Avenue, Atlanta, Ga.

RYCO is prescribed by pediatrists everywhere. Experience has shown that this safe milk agrees when other forms of milk are not tolerated and is of especial value in difficult feeding cases.

Enviable international clinical history confirms these facts and Dryco is therefore very justly known as "The Standard Dry Milk."

Physicians realize that there is a vast difference in the clinical results obtained with various dry milks. They know that Dryco can always be relied upon because years of research and factory procedure are back of its quality.

Clinical data and Dryco samples upon request

The Dry Milk Company, **18 Park Row, New York, N. Y.**

CALCREOSE

in ENTERITIS

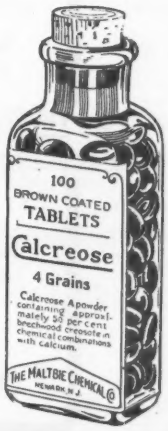
"CREOSOTE and guaiacol are used internally as intestinal and urinary antiseptics, as stimulant expectorants in bronchitis and in the treatment of tuberculosis. Their local irritant actions often interfere with their internal administration."

—N.N.R. 1925, p. 99

DURING the summer months intestinal antisepsis is particularly desired in connection with the treatment of various diseases of the intestinal tract.

CALCREOSE, being a combination of equal parts of creosote and calcium oxide, is especially useful in this connection because it supplies all the benefits of creosote without the possible disturbances caused by creosote alone.

Calcreose can be given in large doses for long periods without apparent difficulty.



Powder: Tablets: Solution **Samples of Tablets on Request**

THE MALTBIE CHEMICAL COMPANY
NEWARK, NEW JERSEY

SAVE MONEY ON

YOUR X-RAY SUPPLIES

Get our price list and discounts on quantities before you purchase

HUNDREDS OF DOCTORS FIND WE SAVE THEM FROM 10% TO 25% ON X-RAY LABORATORY COSTS.

AMONG THE MANY ARTICLES SOLD ARE:

X-RAY PLATES. Three brands in stock for quick shipment. PARAGON Brand for finest work; UNIVERSAL Brand, where price is important.

X-RAY FILMS. Duplitized or Dental—all standard sizes. Eastman, Ilford or X-ograph metal backed. Fast or slow emulsion.

BARIUM SULPHATE. For stomach work. Finest grade. Low price.

COOLIDGE X-RAY TUBES, 5 styles, 10 or 30 milliamp.-Radiator (small bulb), or broad, medium or fine focus, large bulb. Lead Glass Shields for Radiator type tubes.

DEVELOPING TANKS. 4 or 6 compartments, stone tanks. These will end your dark room troubles. 5 sizes of Enameled Steel Tanks.

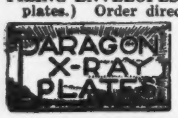
DENTAL FILM MOUNTS. Black or gray cardboard with celluloid window or all celluloid type, one to eleven film openings. Special list and samples on request. Price includes imprinting name and address.

DEVELOPER CHEMICALS. Metol, Hydroquinone, Hypo, etc.

INTENSIFYING SCREENS. Patterson TE, or celluloid-backed screens. Reduce exposure to ¼th or less. Double screen for film. All-metal cassettes.

LEADED GLOVES AND APRONS. (New type glove, lower priced.)

FILING ENVELOPES with printed X-ray form. (For used plates.) Order direct or through your dealer.



If You Have a Machine Get Your Name on Our Mailing List.

GEO. W. BRADY & CO.

780 So. Western Ave. CHICAGO, Ill.

(Continued from page 46)

Dr. Frank David Smythe, Memphis, aged 59, died recently.

Dr. G. K. Waits, Minor Hill, aged 46, died March 13.

Dr. J. C. Wilhite, Sardis, died April 1 of heart disease.

TEXAS

Fannin County Medical Society has elected Dr. J. J. Cappleman, Honey Grove, President; Dr. J. J. Pendergrass, Leonard, Vice-President; Dr. O. C. Nevill, Bonham, Secretary-Treasurer, reelected.

Red River County Medical Society has elected Dr. H. R. Smith, Detroit, President; Dr. Claud D. Scaff, Clarksville, Vice-President; Dr. J. H. Stiles, Clarksville, Secretary-Treasurer.

Panhandle District Medical Society has elected Dr. A. J. Caldwell, Amarillo, President; Dr. H. H. Latson, Amarillo, President-elect; Drs. E. O. Nichols, Plainview, and W. S. Miller, Estelline, Vice-Presidents; Dr. J. J. Crume, Amarillo, Secretary, reelected.

Wharton-Jackson Counties Medical Society has elected Dr. A. L. Lincecum, El Campo, President; Dr. H. C. Reynolds, Louise, Vice-President; Dr. H. V. Reeves, El Campo, Secretary-Treasurer, reelected.

The Woman's Auxiliary to the Dallas County Medical Society has elected Mrs. O. M. Marchman, President; Mrs. J. H. Marshall, First Vice-President; Mrs. Abell D. Hardin, Second Vice-President; Mrs. John McLaurin, Recording Secretary; Mrs. A. W. Nash, Corresponding Secretary; Mrs. E. V. Dickey, Treasurer; Mrs. J. M. Boyd, Parliamentarian; Mrs. Charles L. Martin, Press Reporter.

An anonymous donor has given $75,000 to be applied on building a modern hospital for the negroes of Houston, the site for which has already been purchased. The gift will be supplemented by the City.

Contract has been let for the construction of the Fred Roberts Memorial Hospital at Corpus Christi to cost about $60,000.

Dr. Joel E. Wright, Alpine, has been elected Health Officer of Brewster County.

Dr. Harold I. Gosline, Dallas, has resigned as Di-

(Continued on page 50)

NOVASUROL

Trademark Reg. U. S. A. Pat. Off.

Brand of MERBAPHEN

The Dependable Diuretic
In Cardiorenal Dropsies:

When every other remedy fails in serious cardiorenal conditions a single injection of Novasurol often induces prompt and profuse diuresis with subsidence of edema.

The Improved Mercurial
Injection for Syphilis:

Novasurol is preferred by many syphilologists to other soluble mercurials, because of its high content of mercury but low toxicity, general painlessness of injections, prompt and prolonged action. It can be injected alone or mixed with arsphenamin.

HOW SUPPLIED: 1.2 c. c. ampules, in boxes of 5.

Pamphlet on Request

WINTHROP CHEMICAL COMPANY, Inc., 117 Hudson St., New York, N. Y.

Say "AH!"

Can you always make a quick, efficient throat examination? Simplex Tongue Depressor promotes a speedy, thorough diagnosis, using only ONE hand. It gives a flood of light that can be condensed to a highly concentrated spot by a mere twist of the fingers. Use of the standard wooden spatula maintains strict sanitation.

Simplex Tongue Depressor can be obtained at any one of our 138 branches.

No. 1266 Simplex Tongue Depressor with large battery handle, in case.....$21.50

American Optical Company

Factories at Southbridge, Cambridge and Worcester, Massachusetts

Sales Headquarters: 70 West 40th St. New York. Branches in principal cities

A NEW MILK MODIFIER

MODILAC

THE variation in the proportion of proteins, fats and sugars in human and cow's milk, makes the modification of the latter essential when using as an infant food.

The ideal milk modifier should

1. Offset the sugar deficiency in cow's milk.
2. Overcome the deficiency in the potassium and sodium salts.
3. Neutralize the excessive acidity of cow's milk.
4. Change the physical character of the large, tough, indigestible curd of cow's milk, to the fine flocculent masses characteristic of human milk.

Modilac-Merrell in a single modifying unit or tablet, meets all these requirements.

Each Modilac Tablet inserted in a sterile nursing bottle will effectively modify two fluidounces of feeding.

Send for reprints, literature and samples.

THE WM. S. MERRELL COMPANY
FOUNDED 1828
CINCINNATI, U.S.A.

The "MESCO" Laboratories manufacture the largest line of Ointments in the world. Sixty different kinds. We are originators of the Professional Package. Specify "MESCO" when prescribing Ointments. Send for lists.

Manhattan Eye Salve Company

Louisville, Kentucky.

(Continued from page 48)

rector of the Child Guidance Clinic to devote his entire time to his private practice.

Deaths

Dr. L. D. Coffman, Terrell, aged 60, died March 21 following a month's illness.

Dr. Thomas Martin Darwin, Cooper, aged 47, died March 30.

Dr. Joseph W. Gregory, Cisco, aged 57, died April 12 of cerebral hemorrhage.

Dr. William Hobdy, Hamilton, aged 65, died February 27.

Dr. Alexander R. Shadden, San Augustine, aged 76, died in April of chronic bronchitis.

Dr. Ralph Steiner, Austin, aged 67, died May 2.

Dr. H. A. Swafford, Sherman, aged 71, died May 9.

Dr. Samuel A. Street, Austin, aged 57, died December, 1925.

VIRGINIA

The Central District Medical Society, representing the counties of Prince Edward, Amelia, Nottoway, Lunenburg, Charlotte, Appomattox, Buckingham, Cumberland, Powhatan and Mecklenburg, was organized on April 17 at Farmville. Dr. P. A. Irving, Farmville, was elected President; Drs. Carter Weisiger, Cumberland, and W. R. Martin, Charlotte C. H., Vice-Presidents; Dr. W. E. Smith, Farmville, Secretary-Treasurer. Meetings will be held bi-monthly in Farmville.

Charlotte County Medical Society decided to reorganize and applied for a charter from the State Society. Dr. C. W. Tucker, Drakes Branch, was elected President; Dr. R. A. Moore, Phenix, Vice-President; Dr. W. R. Martin, Charlotte C. H., Secretary.

Cumberland County Medical Society was organized recently by the doctors from that County. Dr. Carter Weisiger, Cumberland, was elected President; Dr. Nash P. Snead, Cartersville, Secretary-Treasurer.

Princess Anne County Medical Society has reor-

(Continued on page 52)

The Management of an Infant's Diet

Summer Diarrhea

Mellin's Food — **4 level tablespoonfuls**
Water (boiled, then cooled) — **16 fluidounces**

This formula provides a means of supplying the principal fuel utilized in the body for the production of heat and energy and furnishes immediately available nutrition well suited to protect the proteins of the body, to prevent rapid loss of weight, to resist the activity of putrefactive bacteria, and to favor a retention of fluids and salts in the body tissues.

While the condition of the baby will guide the physician in regard to the amount and intervals of feeding, the usual custom is to give one to three ounces every hour or two until the stools lessen in number and improve in character. The food mixture may then be gradually strengthened by substituting one ounce of skimmed milk for one ounce of water until the amount of skimmed milk is equal to the quantity of milk usually employed in normal conditions.

Mellin's Food Co., 177 State Street Boston, Mass.

Something Better

42 YEARS OF CONSTANT PROGRESS AND IMPROVEMENT BACK OF EVERY PIECE OF ALLISON EQUIPMENT

*"I am indeed pleased with the entire equipment. Believe I have as handsome an office as there is in Washington."

*Paragraph from *REAL* letter; the kind that comes into our office frequently. Name on request.

COMPARE

We invite comparison of specifications and general design. It is to the discriminating buyer that we desire to cater.

Complete Catalog on Request

W. D. ALLISON CO., MFRS.

931 N. Alabama St. **Indianapolis**

Sold by reliable dealers everywhere

STOVARSOL

(REG. U. S. PATENT OFFICE)

Acetylamino-oxyphenylarsonic Acid

Indicated in Amebic Dysentery

Accepted by Council of Pharmacy and Chemistry A. M. A.

Distributed in bottles of 25 tablets, each tablet 0.25 grams
May be obtained through your druggist

Literature furnished on request

MANUFACTURED BY

POWERS-WEIGHTMAN-ROSENGARTEN CO.

New York **PHILADELPHIA** **St. Louis**

I. L. LYONS
& CO., LTD.
Established 1866

OVER A HALF CENTURY OF SERVICE TO HOSPITALS AND PHYSICIANS IN THE SOUTH

X-Ray and Physiotherapy Apparatus
Ultra Violet Lamps

Catalogues on Request

NEW ORLEANS

PHYSIOTHERAPY
APPARATUS

Let us equip your office

THOMPSON-PLASTER
X-RAY COMPANY

LEESBURG, VA.

(Continued from page 50)

ganized and has elected Dr. R. E. Whitehead, Norfolk, President; Dr. H. F. Dormire, Virginia Beach, Vice-President; Dr. Cora Z. Corpening, Virginia Beach, Secretary-Treasurer.

It was voted that a new charter be secured from the State Society to include several additional counties to the Southwestern Virginia Medical Society, of which Dr. J. M. Miller, Wytheville, is President, and Dr. E. G. Gill, Roanoke, Secretary.

The South Piedmont Medical Society has elected Dr. E. Howe Miller, Danville, President; Drs. I. C. Harrison, Danville, C. D. Barksdale, Sutherlin, W. S. Ferguson, Lynchburg, and P. F. Tucker, Milton, N. C., Vice-Presidents; Dr. George A. Stover, South Boston, Secretary-Treasurer, reelected.

The Virginia Society of Oto-Laryngology and Ophthalmology has elected Dr. C. M. Miller, Richmond, President; Dr. C. S. Dodd, Petersburg, Vice-President; Dr. Fletcher D. Woodward, Charlottesville, Secretary-Treasurer. The next meeting will be held in Charlottesville.

At a meeting of the women physicians of Richmond who are members of the Medical Society of Virginia on March 26, Dr. Mary B. Baughman, Richmond, was elected President; Dr. Cora Z. Corpening, Virginia Beach, Secretary-Treasurer.

The private hospital of Dr. E. G. Gill, the Gill Memorial Eye, Ear and Throat Hospital, will be opened in Roanoke about the first of July. Only graduate nurses will be employed. The hospital will have departments for ophthalmology, oto-laryngology, bronchoscopy and esophagoscopy and facio-maxillary surgery. Dr. Charles A. Young, Roanoke, will be associated with Dr. Gill.

A drive is on to raise $1,000,000 for additional buildings and increased activities at the Medical College of Virginia. The plan is to raise $500,000 in the City of Richmond and $500,000 from the remainder of the State.

The promotions from instructor to assistant professor in the faculty of the Medical School of the University of Virginia, to become effective next session, are: Dr. Vincent W. Archer, roentgenology; Dr. Henry B. Mulholland and Dr. James Edwin Wood, internal medicine.

Dr. J. M. Holloway was elected President of the Fredericksburg Gun Club at its organization meeting recently.

Dr. Nelson Mercer, who recently returned to private practice in Richmond, was on April 24 promoted to the rank of Lieutenant Colonel in the Medical Reserve Corps of the U. S. Army.

Dr. A. D. Ownbey, Newport News, located in Miami, Florida, the latter part of January

Dr. H. S. Hedges, Charlottesville, and Dr. R. D.

(Continued on page 54)

CLASSIFIED ADVERTISEMENTS

WANTED—Internes for the New York Skin and Cancer Hospital for the Surgical and Dermatological Divisions. Services beginning August 1st and October 1st. New York Skin and Cancer Hospital, Second Avenue at Nineteenth Street, New York, N. Y.

WANTED—Good eye man. Must have ability. Will not need money if ambitious and willing to work. Prefer man under 40. Give full particulars. Address L. C. E., care Journal.

WANTED at once young man physician with at least one year's hospital training as assistant urologist for large clinic. Must accept position with view of acquiring training in urology. Excellent opportunity for training with salary. Also clinical laboratorian, man, good bacteriologist. Also woman laboratorian. Hamilton Medical Exchange, 1415 Fidelity Bank Building, Memphis, Tenn.

REGISTER with the South's own Medical Exchange. Physicians, nurses, x-ray technicians, dietitians, pharmacists, etc. No charge to employers. New exchange. New methods. Hamilton Medical Exchange, 1415 Fidelity Bank Building, Memphis, Tenn.

ORGANOTHERAPY

can be effective only through the use of dependable endocrine products. The reputation and integrity of the manufacturer is the physician's only guarantee of reliability of those organotherapeutic products for which there is no chemical or biological assay. Every manufacturing process and all our product is supervised by our Analytical and Research Department.

DESSICATED PITUITARY BODY, U.S.P.	EPINEPHRIN
CORPUS LUTEUM	EPINEPHRIN AMPULES
CORPUS LUTEUM AMPULES	SOLUTION OF EPINEPHRIN (1-1000)
PANCREATIN, U.S.P.	DRIED SUPRARENALS, U.S.P.
SOLUTION OF POST-PITUITARY	DRIED THYROIDS, U.S.P.

insure potency and constancy of action by prescribing the products of

G. W. CARNRICK CO.

Manufacturers of Organotherapeutic Products

417-421 Canal Street, New York, N. Y.

CAPROKOL

(Hexylresorcinol, S & D.)

$C_6H_3(OH)_2C_6H_{13}$

THERAPEUTICS

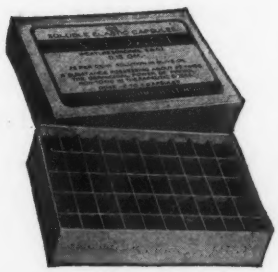
Indicated in the treatment of infections of the urinary tract.

Approximately 45 times the germicidal power of Phenol.

Non-toxic in therapeutic doses.

Renders the urine germicidal.

FOR ADULTS:
Soluble Elastic Capsules
CAPROKOL
FOR CHILDREN:
Solution CAPROKOL



REFERENCES:

Jour. A. M. A. Dec. 20th, 1924, Vol. 83, pp. 2005-2011.
Jour. of Urology, Dec. 1924, Vol. XII, No. 6.
The Canadian Med. Assoc. Jour. 1925, Vol. XV, pp. 787-788.
Jour. of Urology, Aug. 1925, Vol. XIV, No. 2.
Jour. A. M. A., Dec. 12th, 1925, Vol. 85, No. 24, pp. 1855-1861.
American Journal Diseases of Children, Vol. 31, No. 2, Feb. 1926.
Jour. A. M. A., March 6th, 1926, Vol. 86, No. 10, pp. 668-670.
Minnesota Medicine, April 1926, Vol. 9, No. 4, pp. 156-160.

LITERATURE SENT UPON REQUEST

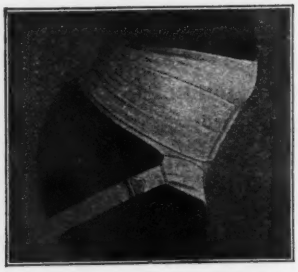
SHARP & DOHME
BALTIMORE

New York Chicago New Orleans St. Louis Atlanta Philadelphia Kansas City San Francisco Boston

TRADE MARK REG. **STORM** TRADE MARK REG.

Binder and Abdominal Supporter

(Patented)



Trade Mark Reg. Trade Mark Reg.

For Men, Women and Children

For Ptosis, Hernia, Pregnancy, Obesity, Relaxed Sacro-Iliac Articulations, High and Low Operations, etc.

Ask for 36 page Illustrated Folder

Mail orders filled at Philadelphia only—within 24 hours.

KATHERINE L. STORM, M.D.,
Originator, Patentee, Owner and Maker
1701 Diamond St. Philadelphia

(Continued from page 52)

Tucker, Powhatan, were among the local chairmen named to interest Virginians in forest conservation during American Forestry Week, this spring.

Dr. George W. Schenck, Norfolk, has accepted the captaincy of Ambulance Company No. 110, succeeding Captain Albert V. Crosby, resigned.

Dr. W. R. Cushing was elected chairman of the Board of Directors of the Bank of Dublin at a meeting of the stockholders held recently.

Dr. C. Mason Smith was recently elected one of the Directors of the Fredericksburg Rotary Club for the ensuing year.

Dr. George W. Parson, Raven, and Miss Beatrice Elizabeth Smither, Richmond, were married April 24.

Deaths

Dr. William Edward Anderson, Farmville, aged 59, died May 10 at the Stuart Circle Hospital, Richmond.

Dr. Harry Gilmore Carter, Burkeville, aged 39, died April 10 of pulmonary tuberculosis.

Dr. George Burley Martin, formerly of Richmond, aged 43, died April 11 at the U. S. Hospital at Oteen, N. C.

Dr. William Graham Painter, Big Stone Gap, aged 50, died April 22 at the George Ben Johnston Memorial Hospital, Abingdon, of coronary thrombosis.

Dr. Lemuel Cornick Shepherd, Norfolk, aged 62, died April 4 of a self-inflicted bullet wound.

WEST VIRGINIA

Greenbrier Medical Society has elected Dr. D. G. Preston, Lewisburg, President; Dr. C. F. Mahood, Alderson, Secretary-Treasurer.

Dr. Mortimer D. Cure, appointed Superintendent of the Weston State Hospital, Weston, succeeding Dr. Cecil Denham, entered upon his duties May 1.

Deaths

Dr. William Bruce Borror, Morgantown, aged 46, was killed in his office April 15 by an assailant.

Dr. Estcn B. Stephenson, Charleston, died April 17.

Dr. Wilbur Fisk Shirkey, Charleston, aged 67, died March 29 of heart disease.

THE STANDARD

LOESER'S INTRAVENOUS SOLUTIONS

CERTIFIED

HAY FEVER and ASTHMA

Loeser's Intravenous Solution of Sodium Iodide

20 cc. contain 2 Grams (31 grains) Sodium Iodide U. S. P.
10 cc. contain 1 Gram (15 grains) Sodium Iodide U. S. P.

Chemically and biologically standardized. Ready to inject.

For the treatment of Asthma, Hay Fever, Bronchitis, Pneumonia, Arteriosclerosis, Hypertension, Nephritis, the Sequelae of Gonorrhea and Chronic Infections.

Send for literature and the May number of the Journal of Intravenous Therapy.

LOESER LABORATORY

[NEW YORK INTRAVENOUS LABORATORY]

New Location: 22 WEST 26th STREET, NEW YORK, N. Y.

INFANT DIET **MEAD'S** MATERIALS

DEXTRI-MALTOSE
for Infants

It is generally accepted by pediatricians that the ordinary sugars used in infant food mixtures are often the cause of digestive disturbances.

YET—the importance of carbohydrate additions to milk mixtures is recognized.

MEAD'S DEXTRI-MALTOSE

is a preparation of equal parts of dextrins and maltose. It has the following advantages over other forms of sugar in supplying the carbohydrate deficiency of diluted cow's milk:

It can be assimilated by the infant in greater amounts than other sugars

It requires the least amount of energy on the part of the infant to assimilate it

It is the form of carbohydrate least likely to cause diarrhea

It produces a quicker gain in weight than any other form of carbohydrate

Pediatricians in various parts of the world have agreed with the above statements, and have prescribed DEXTRI-MALTOSE with cow's milk for the artificial feeding of infants.

The Mead Policy

Mead's Infant Diet Materials are advertised only to physicians. No feeding directions accompany trade packages. Information in regard to feeding is supplied to the mother by written instructions from her doctor, who changes the feedings from time to time to meet the nutritional requirements of the growing infant. Literature furnished only to physicians.

MEAD JOHNSON & COMPANY, Evansville, Indiana, U. S. A.

Manufacturers of Infant Diet Materials Exclusively

PARKE, DAVIS AND COMPANY

ADRENALIN

ORIGINAL

P. D. & CO.

TRADE MARK

EPINEPHRIN P. D. & CO.

ANY physician familiar with the spirit and purpose of the House of Parke, Davis & Co. can well understand that our work with Adrenalin did not end with its discovery, back in 1900. What has been termed the "noble dissatisfaction" that permeates our entire institution prevented us from considering that discovery, epoch-making as it was, as anything but a starting point.

For the past twenty-five years, therefore, we have been studying Adrenalin intensively and continuously. Many intricate problems have been grappled with and solved. This has enabled us to improve our manufacturing processes from time to time so that Adrenalin—the Parke, Davis & Co. product—is as pre-eminent today among a host of imitations as it was when it occupied the field alone.

And that explains why most physicians specify—and insist upon getting—genuine Adrenalin.

PARKE, DAVIS & COMPANY
DETROIT, MICHIGAN

ADRENALIN IS INCLUDED IN N. N. R. BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION